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HEMORRHAGE AS A FORM OF ASPHYXIA *

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CONCEPTIONS OF HEMORRHAGE

Hemorrhage as a cause of depression and death has heretofore generally been considered from the standpoint of the mechanics of the circulation. The loss of blood has been thought of as bringing about its effects through the fall of blood pressure.

At first, the arteries were thought of as inadequately filled,[1] and the condition was conceived as like vasomotor failure. This was the conception of which Crile[2] was the outstanding advocate. Later the point of view was developed by Henderson,[3] Mann[4] and others, and has now been generally accepted,[5] that, as the peripheral reservoirs are depleted, the venous return to the right heart is lessened,[6] and finally becomes inadequate. As the left heart can discharge into the arterial system only so much blood as runs into the right heart from the veins, the weakened pulse, decreased blood stream, and lowered pressure are necessary consequences of deficient venous return.[7]

This conception of hemorrhage is exemplified in the general belief—a belief which, so far as we are aware, no one heretofore has queried—that some solution can be found for intravenous infusion which may serve to replace a large fraction of the blood. The nature of this belief and its implications are shown by the qualities which are supposed to be needed in such a solution. Thus, stress is laid on the fact that infusions of saline do not remain in the blood vessels but pass into the tissues; hence the attempt first by Martin H. Fischer[8] and his pupils to introduce a solution which would overcome this particular defect. Emphasis is also placed by some writers on the lack of viscosity in saline solutions, and in consequence their too easy passage through the capillaries. The failure of mere saline solutions to afford anything more than temporary relief is assigned, therefore, to their inadequacy because of these defects in maintaining arterial pressure. It is thus tacitly assumed that a solution with the mechanical and chemical properties to meet these needs would be the much sought ideal for intravenous infusion after hemorrhage, and that it could be used to replace a considerable fraction of the blood. We may term this view the circulatory conception of hemorrhage.

A great amount of experimental work has been done on the acute effects of hemorrhage; and practically all of it has had as its background the circulatory conception defined above. But, we may ask, has the total of this work contributed very much, beyond what Stephen Hales could have told us, to a satisfactory theoretical understanding of the effects of blood loss; or even to defining what, outside the fall of arterial pressure, these effects really are, or to efficient artificial measures for counteracting them? (In the sense in which the word "artificial" is here used, transfusion of blood is a natural, not an artificial therapeutic measure.) It would be going too far to give a negative answer to these questions, but, on the other hand, they can elicit at most a qualified and hesitating affirmative, and this only by neglecting nearly all the effects except the fall of arterial pressure.

The inadequacy of the circulatory conception is illustrated by the recent controversy regarding the value of gum acacia saline solution which Bayliss[9] and his collaborators tried to introduce. The verdict which seems generally to have been returned by surgeons who have tried this infusion has been adverse;[10] at least the beneficial effects seem to fall far short of the results obtained by the transfusion of an equal amount of blood. And yet, judged by the criteria of the circulatory view of hemorrhage, as Bayliss, Erlanger and Gasser[11] and others have shown, acacia saline possesses properties which make it a close approximation to the

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* Based on work carried out in this laboratory in 1917-1918, under the war gas investigations and aviation investigations of the Bureau of Mines, the Chemical Warfare Service, the Surgeon-General's Office and the Shock Committee of the National Research Council. Our thanks are especially due to Col. F. F. Russell of the Surgeon-General's Office, to whose cordial interest we owe to a large extent the opportunity and personnel of this investigation.

1. Von den Velden, R.: Arch. f. exper. Path. u. Pharmakol. **61:** 37, 1909 (bibliography on hemorrhage).
2. Crile, G. W.: Surgical Shock, 1899; Keen's Surgery **1:** 79, 922, 1906.
3. Henderson, Yandell: Am. J. Physiol. **21:** 126, 1908; **23:** 345, 1909; **27:** 152, 1910.
4. Mann, F. C.: Bull. Johns Hopkins Hosp. **25:** 205, 1915; Surg., Gynec. & Obst. **21:** 430, 1915.
5. Dale, H. H.: Harvey Lectures, 1919-1920, p. 26.
6. Henderson, Yandell, and Barringer, T. B.: Am. J. Physiol. **31:** 288, 352, 1913. Henderson, Yandell, and Harvey, S. C.: Ibid. **46:** 533, 1918. Henderson, Yandell, and Haggard, H. W.: J. Pharmacol. & Exper. Therap. **11:** 189 (April) 1918.
7. Meek, W. J., and Eystes, J. A. E.: Am. J. Physiol. **56:** 1 (May) 1921.
8. Hogan, J. J., and Fischer, M. H.: Kolloidchem. Beihefte **3:** 385, 1912. Fischer, M. H.: Oedema and Nephritis, Ed. 3, 1921, p. 403.
9. Bayliss, W. M.: Reports to the Special Investigation Committee on Surgical Shock, No. 1, London, 1917; No. 3, 1918; Intravenous Injection in Wound Shock, London, 1918; republished in Medical Research Committee Reports, Wound Shock and Hemorrhage, London, 1919.
10. Bernheim, B. B.: Hemorrhage and Blood Transfusion in the War, J. A. M. A. **73:** 172 (July 19) 1919.
11. Erlanger, J., and Gasser, H. S.: Ann. Surg. **69:** 389 (April) 1919 (good bibliography). Erlanger, J.: Physiol. Rev. **1:** 177, 1921.

solution which, if that view were adequate, should be the ideal. This discrepancy certainly suggests strongly that the circulatory conception of hemorrhage, while containing much of value, must be in some essential feature incomplete.

In the light of the observations to be here reported, the inadequacy seems to consist in neglecting two closely related elements: First, a sufficient rôle has not been assigned to the loss of red corpuscles.[12] Second, the effects of hemorrhage must be considered, not only from the standpoint of the circulation, but also from that of respiration and vital energetics. The red corpuscle is the essential connecting link between the mechanism of breathing and the vital oxidation in the tissues. Without an adequate oxygen and carbon dioxid transporting power in the blood, pulmonary ventilation and heart action may be pushed to exhaustion, as in air hunger; and yet the tissues may at the same time suffer asphyxia. Indeed, air hunger is a symptom of this asphyxia. Furthermore, the recognition of hemorrhage as a form of asphyxia makes immediately available for application to its problems the mass of new knowledge which has accumulated in recent years regarding the various forms of slow or partial asphyxia. For instance, the recent advances in our understanding of the condition from which the aviator suffers,[13] and in that induced by carbon monoxid,[14] become thus, with slight modification, applicable to the problems of hemorrhage. It is now known that it is oxygen [15] which fundamentally and quantitatively controls the adjustment of the alveolar carbon dioxid, the volume of air breathed at rest, and the blood alkali. Simple quantitative methods are now available for the observation of respiration [16] and for determining the gases and alkali of the blood; and these methods are thus made applicable to the estimation and prognosis of hemorrhage.

Before turning to this special topic, however, we desire to present certain data bearing upon the general field of hemorrhage and its treatment.

GENERAL PURPOSE AND METHODS OF EXPERIMENTATION

The data are taken from a very large mass of material collected in this laboratory for the Shock Committee of the National Research Council during the war. The material was not originally collected with any particular bearing upon the special topics to be here stressed. It is, therefore, of so diffuse a character and so far parallels the work of others that we shall for the most part merely summarize it, going into detail only on the particular topics of respiration and blood alkali, so as to show the similarities to, and the differences from, other forms of asphyxia.

All of the experiments were performed on dogs. No general anesthetic was used, as all drugs of that class render respiration abnormal; but care was taken to avoid even the slightest excitement, anxiety or pain. The blood was drawn from the femoral artery, which had been exposed under cocain. Its carbon dioxid content was determined and also the carbon dioxid capacity after equilibration with alveolar air, to estimate the blood alkali. Respiration was measured by means of a mask, made air tight over the nose and mouth with adhesive plaster, connected with inspiratory and expiratory valves, and a gas meter of low resistance, or a large counterpoised spirometer.

The general data of fifty-three experiments are contained in Table 1.

TABLE 1.—RESULTS OF VARIOUS DEGREES OF HEMORRHAGE (FIRST EIGHTEEN EXPERIMENTS) AND EFFECTS OF SOME TREATMENTS

Experiment No.	Body Weight, Kg.	Hemorrhage-C.c.	Hemorrhage / Body Weight Per Cent.	Arterial Pressure at End of Hemorrhage, Mm. Mercury	Outcome
1	16.5	740	4.5	20	Death, 30 minutes
2	12.5	650	5.5	22	Death, 30 minutes
3	9.5	470	4.8	22	Death, 20 minutes
4	9.6	478	5.0	23	Death, 45 minutes
5	20.0	1,100	5.5	23	Death, 40 minutes
6	11.0	417	3.8	25	Death, 45 minutes
7	19.0	1,096	5.8	28	Death, 3 hours
8	9.0	470	5.2	28	Death, 2 hours
9	16.7	620	3.9	28	Lived
10	14.0	970	5.5	28	Lived
11	12.7	600	4.7	28	Lived
12	19.5	620	3.2	30	Lived
13	20.0	900	4.5	30	Lived
14	9.0	408	3.2	30	Lived
15	15.5	639	4.1	30	Lived
16	18.0	750	4.2	38	Lived
17	6.7	340	3.2	48	Lived
18	10.0	240	2.4	50	Lived
Intravenous Injection of Physiologic Sodium Chlorid Solution Equal in Volume to Blood Previously Drawn					
19	12.9	340	2.9	30	Lived
20	12.0	500	4.2	30	Lived
21	13.2	520	4.0	30	Death, 3 hours
22	9.2	400	4.3	30	Death, 4 hours
23	12.0	600	5.0	35	Death, 3 hours
24	16.5	920	5.8	30	Lived
25	18.0	680	3.8	30	Lived
26	9.5	510	5.6	30	Lived
Intravenous Injection of 2 Per Cent. Sodium Bicarbonate Equal in Volume to Blood Previously Drawn					
27	25.0	1,090	4.9	30	Lived
28	17.0	729	2.9	25	Lived
29	17.5	920	5.4	25	Lived
30	13.0	640	5.0	22	Death, 14 hours
31	14.0	600	4.4	27	Lived
32	12.0	610	4.5	25	Lived
Morphin, 0.02 Gm. per Kilogram at End of Hemorrhage					
33	7.5	224	3.0	52	Lived
34	7.8	240	3.1	40	Lived
35	10.0	480	4.8	30	Death, 2 hours
36	9.7	510	5.2	30	Death, 1′ 40″
37	12.0	600	5.0	30	Death, 7 hours
Morphin (as above) and Saline (as above)					
38	25.0	1,000	4.8	30	Lived
39	14.0	620	4.5	28	Lived
40	10.1	506	5.0	26	Death, 2 hours
Inhalation of Carbon Dioxid (5 to 9 Per Cent.) in Air until Death or, at Most, One or Two Hours					
41	16.5	740	4.6	30	Death, 4 hours
42	11.0	485	4.5	30	Death, 6 hours
43	10.5	335	3.3	30	Death, 1 hour
44	10.0	560	5.6	42	Death, 50 minutes
45	7.1	390	5.6	30	Death, 1′ 40″
46	10.4	285	2.8	35	Death, 2 hours
47	9.5	402	4.3	25	Death, 40 minutes
Intravenous Injection of Gum Acacia in 2 Per Cent. Sodium Bicarbonate Solution, in Volume Equal to Blood Previously Drawn					
48	11.1	650	5.9	32	Lived (dead next day)
49	10.0	520	5.2	30	Lived (dead next day)
50	16.0	760	5.0	30	Lived
51	7.0	310	4.4	28	Lived
52	9.8	500	5.1	26	Lived (dead next day)
53	10.4	490	4.9	23	Death, 2 hours

A STANDARD HEMORRHAGE

A standard hemorrhage was first worked out. It was established that when an animal was bled 0.25 per cent. of its body weight each five minutes during a period of from one to two hours until the blood pressure fell to about 28 mm. and the animal was then left to itself, the chances were about equal as to whether the subject would die or would recover spontaneously.

12. Penfold, W. J.: M. J. Australia **2**: 307 (Sept. 25) 1920; quoted from Red Cell Refusion in the Production of Therapeutic Serums, editorial, J. A. M. A. **76**: 1580 (June 4) 1921.
13. Henderson, Yandell: Science **49**: 431, 1919; Harvey Lectures, 1918-1919. Schneider, E. C.: Physiol. Rev. **1**: 631, 1921.
14. Haggard, H. W., and Henderson, Yandell: J. Biol. Chem. **47**: 421 (July) 1921; The Treatment of Carbon Monoxid Poisoning, J. A. M. A. **77**: 1065 (Oct. 1) 1921.
15. Henderson, Yandell: J. Biol. Chem. **43**: 29 (Aug.) 1920.
16. Henderson, Yandell: Respiratory Experiments on Man, J. A. M. A. **62**: 1133 (April 11) 1914.

All those that were bled to even a slightly less degree survived to the next day and then were improving. All those which were bled at this rate to even a slightly greater degree, that is, to even a few millimeters lower arterial pressure, died within two or three hours or less time after termination of the hemorrhage.

Such an experimental hemorrhage is, of course, essentially arbitrary and not, as might at first be thought, an absolute standard. The three elements—amount of blood drawn, the rate of loss, and the terminal arterial pressure—are so interrelated that a variation of any one would alter the others. Thus, doubtless, a slower withdrawal of less blood to a higher terminal pressure would also be fatal, as the recuperative processes of the organism would be strained for a longer time. The values here used are merely quick and convenient.

The arterial pressure was taken by means of a mercury manometer connected temporarily to the femoral artery. It was found important that the fluid in the cannula should be merely sodium chlorid solution. The effect of introducing inadvertently from the manometer even a small amount of sodium citrate after hemorrhage was almost immediately fatal—a fact of some importance, perhaps, in relation to infusions of citrated blood. Certainly, after hemorrhage no more citrate than absolutely necessary to prevent clotting should be used. A deficiency of calcium as a sequel of hemorrhage is perhaps to be expected; and as citrate presumably acts also on this element in the blood, it would exacerbate any disturbance of the acid-alkali or other balance.

It will be seen from the data in Table 1 that the amount of hemorrhage, at the rate adopted, required to bring an animal to the danger point (28 or 30 mm. arterial pressure) is a variable individual characteristic. The loss of blood varied in different subjects from 3.8 to 5.8 per cent. of body weight before the critical level of pressure was reached, indicating presumably wide individual variations in blood volume.

THE EFFICACY OF VARIOUS TREATMENTS

Having established this standard hemorrhage, we tried out various treatments in order to determine whether and to what extent they improve the chances of recovery.

Morphin, even in moderate doses, as is seen in Experiments 33 to 40, inclusive, markedly increased the mortality among animals that had been subjected to this standard and nearly fatal hemorrhage. This drug quiets respiration; but after the blood alkali has been decreased, either by overbreathing or otherwise, very active respiration is doubtless necessary to prevent excessive rise of the H_2CO_3: $NaHCO_3$ ratio, or relative acidosis. At the same time the blood, owing to lack of corpuscles after hemorrhage, cannot produce sodium bicarbonate from sodium chlorid as readily as it does normally under increased carbon dioxid tension.

Inhalations of carbon dioxid were tried in six experiments (41 to 47). They stimulated respiration and induced marked improvement in the general condition of the animals for a short time, but, if the inhalation was pushed at all, the animals invariably died by vagal inhibition of the heart. This, according to our experience in related lines of work, is a mode of death indicating that the C_H, or H_2CO_3: $NaHCO_3$ ratio, of the blood has been raised abnormally high.[17] Probably somewhat the same explanation as that for the results with morphin applies here also. The muscular exertion of deep breathing under carbon dioxid likewise increases the demand for oxygen. Our findings here reported are thus different in result from those which we have obtained with carbon dioxid therapy in postoperative depression without hemorrhage.[18]

Intravenous infusion of several of the common fluids was also tried. The volume of the infusion was in all cases the same as that of the blood previously withdrawn from the animal. In effect we have thus tested the extent to which the fluid used can perform the functions of blood. Or, more truly, we have thus tested the question of the superiority of fluids supplied from the outside (i. e., intravenously) over that which will be spontaneously drawn from the tissues, after a hemorrhage, when the subject is given water to drink but otherwise is merely left to itself.

Physiologic sodium chlorid solution was injected after hemorrhage in eight animals (Experiments 19 to 26, inclusive). The results tabulated show that it was only temporarily beneficial. In animals which had been brought to the critical point it accomplished in all cases, as might be expected, an intermediate improvement and some prolongation of life. But the evidence presented in the table does not indicate that it considerably improved the chance of recovery.

Sodium bicarbonate solution (2 per cent.) was tried on six subjects (Experiments 27 to 32, inclusive) and was found to make a much better showing than physiologic sodium chlorid solution, as Howell and others found.[19] Our observations led us to believe that the reason for this relative advantage of an alkaline infusion lies in its quieting effect on respiration through its influence on the H_2CO_3: $NaHCO_3$ equilibrium of the blood. We shall develop this topic farther on.

Acacia solution, made up as directed by Bayliss,[9] was found distinctly beneficial immediately after injection. Those animals which received it were, however, usually found dead the next morning. On the whole, we are inclined to regard this fluid as distinctly superior to sodium chlorid solution. Possibly also it is better than sodium bicarbonate alone, although we believe that it owes a part of its advantages to the alkali which it contains and its effects on respiration. The muscular exertion and overventilation of air hunger after hemorrhage are the finally fatal factors, through increase of demand for oxygen combined with oxygen lack and disturbance of the H_2CO_3: $NaHCO_3$ ratio. The restoration of arterial pressure also tends to quiet the breathing.

In contrast and as control to these experiments, let us suppose that in an equal number of animals, within an hour, or at most two, after the beginning of hemorrhage, the same volume of blood as that which had been withdrawn has been reinfused. One knows *a priori* that—neglecting gross mishaps or some alteration or incompatibility in the blood restored—the result would have been almost 100 per cent. complete recoveries.

From these experiments as a whole it appears that the most that infusion of artificial solutions can accom-

17. Haggard, H. W.: Am. J. Physiol. **56**: 390 (July) 1921.

18. Henderson, Yandell; Haggard, H. W., and Coburn, R. C.: The Therapeutic Use of Carbon Dioxid After Anesthesia and Operation, J. A. M. A. **74**: 783 (March 20) 1920; The Acapnia Theory, Now, ibid. **77**: 424 (Aug. 6) 1921.

19. Howell, W. H.: Am. J. Physiol. **4**: 14, 1900; Vaughan's Anniversary Volume, 1903, p. 51. Dawson: Am. J. Physiol. **7**: 1, 1905. Seelig, Tierney and Rodenbaugh: Am. J. M. Sc., August, 1913. Mann, F. C.: Further Experimental Study of Surgical Shock, J. A. M. A. **71**: 1184 (Oct. 12) 1918. Gesell, R.: Am. J. Physiol. **47**: 468 (Jan.) 1919.

plish is replacement of plasma more quickly and perhaps more completely than the body itself could manage by withdrawing fluid from the tissues. On the whole, the results obtained with the infusions were scarcely better than with no treatment at all. This fact points to the idea that the really significant element in hemorrhage is the loss of red corpuscles. The superiority of blood transfusion over the infusion of any artificial solution, as noted by surgeons, finds its explanation, therefore, in the fact that the former supplies corpuscles. It is the corpuscles which transport oxygen between the lungs and tissues. It is the corpuscles which, to an almost equal degree, enable the blood to transport carbon dioxid, partly within themselves and partly through their interaction on the plasma. It is the corpuscles which, to a large extent at least, produce the alkali of the plasma from sodium chlorid.

We are thus led to the conclusion that it is the decrease in the capacity of the blood to perform these functions, and not chiefly the fall of arterial pressure, which is the critical factor in hemorrhage. The low arterial pressure after hemorrhage is perhaps to be regarded as an important symptom, rather than as itself the determining causative agent, since some forms of extremely low blood pressure without hemorrhage (e. g., peptone shock[20]) are borne relatively easily and are successfully survived.

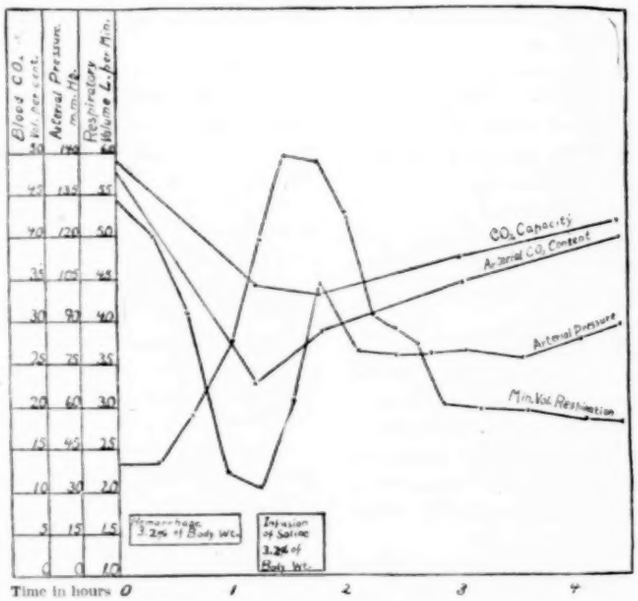

Chart 1.—Standard hemorrhage followed by infusion of saline: Dog, male, 12.9 kg., bled at the rate of 0.25 per cent. of body weight each five minutes until the arterial pressure was 30 mm. A total of 413 c.c. of blood was drawn. At the conclusion of the hemorrhage the same volume of saline was administered intravenously. Arterial pressure, minute volume of respiration, arterial carbon dioxid content, and the carbon dioxid capacity of the blood were recorded as shown.

THE MEANING OF AIR HUNGER

In this laboratory, coincidently with the work on hemorrhage there were under way studies on asphyxia of various forms. Certain similarities between the symptoms seen under low oxygen[13] and under carbon monoxid asphyxia,[14] on the one hand, and those occurring during and after hemorrhage, on the other, caught our attention.

These observations led us to believe that significant information could be gained from noting the reactions of hemorrhage on respiration. It is customary, both experimentally and clinically, to attempt to express the severity of hemorrhage in terms of arterial pressure (Wiggers,[21] Erlanger[11]) and we have followed this practice also. But the facts to be discussed below indicate that the quantity of respiration, that is, the volume of air breathed per minute, is at least as valuable, and perhaps even more significant as an index on which to base diagnosis, and particularly prognosis.

Air hunger, that is, vigorous hyperpnea, as a recognized phenomenon of rapid exsanguination dates at least from Homer, whose heroes gasped when dying from hemorrhage. It is as unescapable an observation as the dyspnea produced by inhaling pure nitrogen or nitrous oxid. But moderate alterations of the volume of air breathed are not perceptible either to the subject or even to an observer. The volume of air breathed per minute cannot be estimated significantly, any more than can arterial pressure, without measurement by appropriate instruments. In relation to respiration, medicine and surgery stand today just where they stood a decade or so ago regarding arterial pressure. The measurement of arterial pressure by means of the sphygmomanometer has given a sweep and clarity to underlying conceptions regarding arterial pressure which the once boasted "tactus eruditus of the trained finger" never could. One may predict with certainty that a similar and greatly needed clearing and strengthening of conceptions with regard to respiration will soon occur; for spirometers and gas meters are being widely introduced in laboratories and hospitals.

The volume of air breathed by a normal man or animal at rest is a very definite function.[22] Even a small percentage increase is a distinct indication of being below par, and a larger variation is an indication of a definitely abnormal condition. For instance, we needed deep pulmonary air with which to equilibrate blood for the determination of its available alkali; and this led to the following observation: In the group of healthy young men drafted as soldiers and assigned to this laboratory, who carried out the experiments on which this paper is based, it was common to note that after a night "on their own" they could not "blow 5.5." In other words, the alveolar air fell below a carbon dioxid tension of 5.5 per cent.; and the volume of breathing is the reciprocal of the alveolar air. None of them, either to themselves or to others, seemed to be breathing more than normally. Indeed, 100 per cent. increase in the resting breathing may be taken as, roughly, the lower limit which is just perceptible subjectively; and perhaps even considerably more would escape the observation of a diagnostician relying merely on the respiratory equivalent of the tactus eruditus.

As an illustration of the lack of the quantitative element in the current conception of respiration, it may here be mentioned that two eminent physiologists have recently stated that, desiring to test the acapnia theory, they asked surgeons at the front whether the wounded breathed excessively, and that the invariable answer was in the negative. But, as we have pointed out above, 100 per cent. increase of breathing is often scarcely perceptible to mere observation; and yet, such an increase involves necessarily a 50 per cent. decrease of the carbon dioxid tension in the alveolar air, since the dilution of the carbon dioxid in the alveolar air

20. Chittenden, R. H.; Mendel, L. B., and Henderson, Yandell: Am. J. Physiol. **2**: 142, 1899.

21. Wiggers, C. J.: The Pathologic Physiology of the Circulation During Hemorrhage, Arch. Int. Med. **14**: 33 (July) 1914; Circulatory Failure, J. A. M. A. **70**: 508 (Feb. 23) 1918.

22. Haldane, J. S., and Priestley, J. G.: J. Physiol. **32**: 225, 1905.

varies with the tidal air, to which the variations of the dead space also are nearly proportionate. And, furthermore, this also involves the ultimate development, as we have shown,[23] of a 50 per cent. decrease of blood alkali—a condition scarcely compatible with the continuance of life. No one would accept testimony that patients had no fever if the witness had no thermometer. Part of the purpose of this paper is to point out that the volume of breathing, per unit gas exchange, is as definite a normal quantity as body temperature, and that no reliable statement or conception can be based on anything less than accurate measurement.

While these observations were being made in this laboratory in 1918, candidates for the aviation service were being tested at the Mineola laboratory by a rebreathing, or low oxygen method introduced by one of us for their ability to withstand great altitude.[24] In the course of this work, Schneider[25] and his collaborators made the new and extremely important observation that even a slight decrease in the oxygen content of the inspired air causes in most men a corresponding increase in the volume of breathing; and this augmentation increases with the oxygen deficiency. Simultaneously we made the same observation on dogs both under low oxygen[26] and under carbon monoxid asphyxia.[14]

We have now to report that virtually the same relation holds true between hemorrhage and respiration. Thus, we find that even a small loss of blood from the circulation—an amount which we had previously supposed would be quite negligible for a healthy subject — induces a distinct increase in the volume of air breathed per unit of oxygen absorbed; and this augmentation of pulmonary ventilation increases in greater and greater degree with each succesive blood loss up to extreme air hunger. Thus, the volume of air breathed per minute is an index of the severity of the hemorrhage.

Furthermore, we find that the quantity of breathing, that is, the volume of air per minute, is of marked value for prognosis. As the reparative processes of the body come into play after hemorrhage, and prove adequate or inadequate, the volume of breathing varies correspondingly. Thus if, apart from merely temporary variations, the volume of breathing gradually lessens, the animal recovers. If it progressively increases, the outcome is always fatal. Somewhat the same relation of breathing and recovery holds in our experiments with the various therapeutic procedures (other than morphin), although with the exception of alkaline solution the beneficial effects were usually merely temporary.

It may seem at first that the volume of air breathed per minute would be, however useful as a basis for prognosis, merely a concomitant of the fundamental processes leading to recovery or death. We believe, however, that the respiratory activity is not merely a concomitant, but also a cause, of progression downward after a critical hemorrhage. Two reasons appear for this: The first is that vigorous breathing involves a considerable muscular exertion and a corresponding demand for additional oxygen—a demand which the organism after hemorrhage is unfitted to supply. The second has to do with the respiratory control of the blood alkali, a topic which we have discussed in a number of papers[23] in other connections recently, and which in its bearings here will be dealt with in the next section.

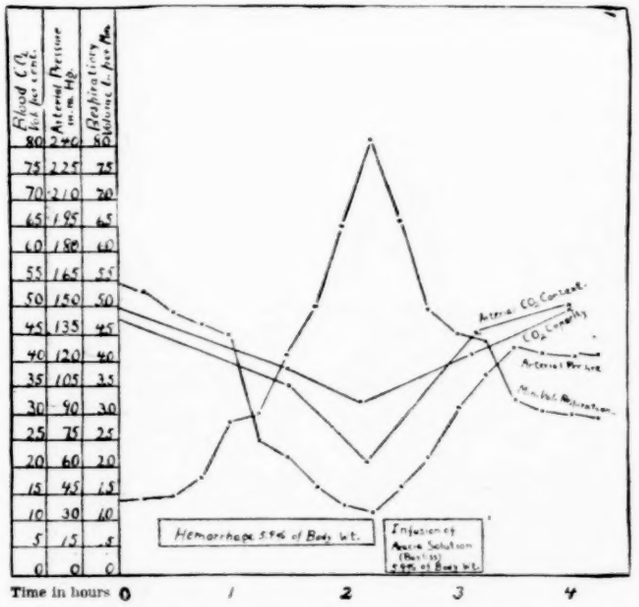

Chart 2.—Standard hemorrhage followed by infusion of acacia solution (Bayliss): Dog, male, 11 kg., bled at the rate of 0.25 per cent. of body weight each five minutes until the arterial pressure was 32 mm. as shown. A total of 659 c.c. of blood was drawn. At the conclusion of the hemorrhage, the same volume of acacia solution was administered intravenously. Arterial pressure, minute volume of respiration, arterial carbon dioxid content, and the carbon dioxid capacity of the blood were recorded.

In the accompanying charts and their legends are shown the data of two typical experiments. In Chart 1, the breathing under hemorrhage increased from 2.4 to 6.0 liters a minute, or 150 per cent. The effect of the acacia solution administered in the second case in quieting respiration is very striking, and the corresponding recovery of blood alkali is noteworthy. The effects on arterial pressure seem to follow those on respiration in Chart 2, while in the preceding experiment, in which physiologic sodium chlorid solution was given, the contrary relation holds true. We are inclined to believe that a large part of the benefit derived from restoration of arterial pressure depends on the quieting effect on respiration in consequence of which the disturbances in the acid-alkali equilibrium of the blood, to be discussed in the next section, are prevented or diminished.

THE CAUSE OF DECREASED BLOOD ALKALI

Associated with the augmentation of breathing after extensive hemorrhage, there occurs also a marked and progressive decrease in blood alkali as measured by the carbon dioxid combining power of the blood. This has been observed experimentally by Milroy,[27] and by Evans,[28] and on wounded soldiers by Cannon,[29] by whom it was assumed (erroneously, we think) to be due to the acidotic process.

23. Henderson, Yandell, and Haggard, H. W.: J. Biol. Chem. **33**: 333 (Feb.) 1918; **39**: 163 (Aug.) 1919.
24. Henderson, Yandell, and Seibert, E. G.: Organization and Objects of the Medical Research Board, Air Service, U. S. Army, J. A. M. A. **71**: 1382 (Oct. 26) 1918.
25. Schneider, E. C.: Physiologic Observations and Methods, J. A. M. A. **71**: 1384 (Oct. 26) 1918. Lutz, B. R., and Schneider, E. C.: Am. J. Physiol. **50**: 280 (Dec.) 1919.
26. Haggard, H. W., and Henderson, Yandell: J. Biol. Chem. **43**: 3, 15 (Aug.) 1920.
27. Milroy, T. H.: J. Physiol. **51**: 259 (Sept.) 1917.
28. Evans, C. L.: Brit. J. Exper. Path. **2**: 105, 1921.
29. Cannon, W. B.: Acidosis in Cases of Shock, Hemorrhage and Gas Infection, J. A. M. A. **70**: 531 (Feb. 23) 1918; A Consideration of the Nature of Wound Shock, ibid. **70**: 611 (March 2) 1918; The Course of Events in Secondary Wound Shock, ibid. **73**: 174 (July 19) 1919; Studies in Experimental Traumatic Shock, IV; Evidence of a Toxic Factor in Wound Shock, Arch. Surg. **4**: 1 (Jan.) 1922.

As a consequence of our standard hemorrhage, a fall of alkali of 33 per cent. was common, and 50 per cent. or even more was observed in some cases. As measures of blood alkali, analysis for total carbon dioxid were made on the arterial blood as drawn, without exposure to air; and also after equilibrating a sample of this blood with 40 mm. of carbon dioxid (normal human alveolar air of 5.5 per cent. carbon dioxid). As the direct arterial figures give a truer indication of the alkali actually in use in the blood than do those after equilibration to 40 mm. of carbon dioxid, the former alone are given in Table 2; but the latter would show the same relations, as may be seen from the parallelism between the curves for carbon dioxid content and carbon dioxid capacity in Charts 1 and 2.

This fall of blood alkali is either itself of critical importance, or is intimately associated with other processes of importance; for in nearly all of these experiments, as seen in Table 2, in which the carbon dioxid content of the blood failed to rise again, or continued to decrease, after the termination of hemorrhage, death resulted. A tendency to rise and even a cessation of fall, on the contrary, were indications of ultimate recovery.

Obviously, the decrease in blood alkali was in some way the result of the deficient oxygen transporting power of the circulation. But through what process does the oxygen deficiency act? It might induce a production of strong acids in the tissues which, by escaping into the blood, would neutralize sodium bicarbonate. This is the acidotic process which is generally assumed to occur.

In our previous work on asphyxia [30] we have shown, however, that this conception is erroneous as regards asphyxia both from low oxygen in the inspired air and from carbon monoxid; and, indeed, that it is almost the direct opposite of what really occurs. Oxygen deficiency first induces excessive breathing before any considerable fall of blood alkali occurs. This ventilates off an abnormally large amount of carbon dioxid, and leaves the blood abnormally alkaline. In compensation, alkali then begins to disappear from the blood. This is the acapnial process. We have shown under conditions other than hemorrhage that down to a certain point the process is reversible, through depression of breathing and high ratio of $H_2CO_3 : NaHCO_3$ or relative acidosis, thus recalling alkali to the blood. Beyond that point the process is not reversible, but inevitably fatal.[31]

All of our evidence indicates now that under progressive hemorrhage the volume of breathing increases exactly as if the subject were inhaling a progressively lowered pressure of oxygen. By this overventilation, the carbon dioxid content of the blood is reduced; and in compensation to this condition of acapnia and relative alkalosis, the alkali of the blood also falls. Thereafter, any depression of breathing, indeed, anything less than 100 or 200 per cent. above the normal volume of respiration, involves an abnormally high ratio of $H_2CO_3 : NaHCO_3$, the so-called relative acidosis. It is, indeed, by means of a relative acidosis that the organism attempts to recall alkali to its blood. But, owing to the deficiency of red corpuscles, it cannot recall alkali as efficiently as normally; for it cannot make the requisite decrease of breathing without intensifying the asphyxia.

30. Henderson, Haggard and Coburn (Footnotes 13, 14, 15, 18, 23 and 26).

31. Haggard, H. W., and Henderson, Yandell: J. Biol. Chem. **45**: 209 (Dec.) 1920.

We do not desire to theorize regarding the part played by acapnia and low alkali in determining recovery or a fatal outcome. The interaction of processes is very complicated. But our data justify these assertions of fact: Whenever the volume of breathing continues to increase after hemorrhage, acapnia develops, the blood alkali falls progressively, and death results. When, on the contrary, the volume of air breathed

TABLE 2.—ALTERATIONS OF CARBON DIOXID CONTENT OF ARTERIAL BLOOD AS INDICATIONS OF BLOOD ALKALI AFTER VARIOUS DEGREES OF HEMORRHAGE; AND THE RELATIONS OF SUBSEQUENT INCREASE OR DECREASE OF ARTERIAL CARBON DIOXID AND ALKALI TO RECOVERY OR DEATH

Experiment No.	Carbon Dioxid Content of Arterial Blood: Before Hemorrhage, per Cent. by Volume	At Termination of Hemorrhage, per Cent. by Volume	After Hemorrhage: per Cent. by Volume	After Hemorrhage: Hours and Minutes	Outcome
1	47	29	..	.. ..	Death, 30 minutes
2	50	24	12	0 30	Death, 30 minutes
3	53	16	..	.. ..	Death, 20 minutes
4	42	28	16	0 30	Death, 45 minutes
			13	0 50	
5	40	26	..	.. ..	Death, 40 minutes
6	44	18	15	0 45	Death, 45 minutes
7	40	23	14	1 45	Death, 3 hours
8	47	21	..	.. ..	Death, 2 hours
9	47	36	27	1 30	Lived
			37	3 00	
			40	24 00	
11	51	28	22	0 45	Lived
			37	2 00	
			51	24 00	
12	48	30	..	.. ..	Lived
13	43	29	38	1 00	Lived
15	45	32	36	2 00	Lived
16	55	44	47	2 00	Lived
			49	24 00	
17	44	42	31	1 20	Lived
			44	3 00	
			58	24 00	
18	53	35	47	24 00	Lived
Intravenous Injection of Physiologic Sodium Chlorid Solution Equal in Volume to Blood Previously Drawn					
20	47	23	30	0 45	Lived
			37	1 45	
			43	24 00	
22	50	26	11	0 45	Death, 4 hours
			19	1 15	
			30	1 40	
			19	3 10	
23	42	24	17	0 45	Death, 3 hours
			21	1 40	
			19	3 40	
24	40	30	13	0 15	Lived
			24	1 15	
			20	2 15	
26	37	19	14	0 20	Lived
			22	1 10	
			24	2 20	
Intravenous Injection of 2 Per Cent. Sodium Bicarbonate Equal in Volume to Blood Previously Drawn					
27	43	30	88	0 30	Lived
			43	24 00	
28	51	29	84	0 35	Lived
			57	24 00	
29	45	32	84	1 30	Lived
			74	2 00	
			62	24 00	
30	51	22	83	2 00	Death 14 hours
Morphin and Saline					
39	47	32	43	0 30	Lived
			38	24 00	
Inhalation of Carbon Dioxid (5 to 9 Per Cent.) in Air until Death or, at Most, One or Two Hours					
41	52	23	42	1 00	Death, 4 hours
			36	3 00	
42	36	33	..	.. ..	Death, 6 hours
43	48	36	42	1 00	Death, 1 hour
44	52	46	50	0 30	Death, 50 minutes
45	43	29	40	1 00	Death, 1′ 40″
47	43	30	42	0 40	Death, 40 minutes
Intravenous Injection of Gum Acacia in 2 Per Cent. Sodium Bicarbonate Solution, in Volume Equal to Blood Previously Drawn					
48	44	13	40	1 15	Lived (dead next day)
			48	2 30	
49	47	27	41	1 00	Lived (dead next day)
52	44	29	45	2 00	Lived (dead next day)
			41	24 00	

ceases to increase or even diminishes, the blood carbon dioxid and alkali show a tendency to rise, and the subject tends to recover. The obvious implication is that animals bled to the critical level and then given inhalations of oxygen would react as do persons at great altitudes or those partly asphyxiated with carbon monoxid; an adequate oxygen supply to the tissues, lessened hyperpnea, conservation of carbon dioxid, and recall of alkali, are closely linked factors in the return toward normal conditions. Our investigations were, however, interrupted (by the termination of the war and the mustering out of the army of the squad of chemists and physiologists who carried out the details of this work) before sufficient material was accumulated to enable us to estimate the degree to which this analogy is susceptible of therapeutic application.

We were thus also prevented from investigating why carbon dioxid inhalation, which is a beneficial accessory in the treatment of some forms of asphyxia, such as that from carbon monoxid, is not so after hemorrhage. Probably the reason lies in the additional demand for oxygen involved in the muscular exertion of the vigorous breathing induced by carbon dioxid as well as the excessive relative acidosis. We regret that we did not try a combination of sodium bicarbonate infusion and carbon dioxid inhalation, or, better, bicarbonate solution plus oxygen and carbon dioxid inhalation. We have since learned also that whenever carbon dioxid therapy is pushed, a protective dose of atropin should be given.

Probably after hemorrhage the capacity of the blood to produce alkali from sodium chlorid under an increased mass-action of carbonic acid is deficient because of insufficient corpuscles. In previous papers we have pointed out,[32] in accord with other investigators,[33] that it is the capacity of the corpuscles to take up hydrochloric acid from sodium chlorid, which chiefly enables the plasma to transport carbon dioxid as sodium bicarbonate, and that this is the process by which the blood obtains much of its alkali. After hemorrhage, the loss of corpuscles results alike in decreased oxygen transporting power, decreased carbon dioxid transporting power, and decreased capacity to produce alkali. Thus, the observations in this section, like those in the preceding section, point to the loss of red corpuscles as the critical factor in hemorrhage.

The evidence suggests the practical use of measurements of the volume of breathing or of the blood alkali (most simply from the carbon dioxid content of the arterial blood or its plasma) for purposes of prognosis, and as a guide and index for the transfusion of whole blood and possibly, too, for oxygen inhalation. These points seem to us to sum up the practical therapeutic lessons of the foregoing data and discussion.

The evidence seems also to afford an explanation for the observation (reported to us by industrial physicians) that even a slight hemorrhage, due to a fall, during carbon monoxid asphyxia, is peculiarly liable to result fatally. Carbon monoxid and hemorrhage act similarly in eliminating red corpuscles, and are therefore mutually additive in their asphyxial effects. On the other hand, withdrawal of blood a few hours later, formerly a common therapeutic procedure, when most of the gas has been eliminated and the functional capacity of the corpuscles thus restored, is not particularly harmful.

Finally, it may be recalled that some years ago one of us showed in a series of papers [34] that excessive pulmonary ventilation induces a condition like shock and like that following hemorrhage. It was shown also that when shock was induced by manipulation of the abdominal viscera, the carbon dioxid content or, as it would now be expressed, the blood alkali, fell very low. More recently, we have shown, in collaboration with Coburn,[18] that the vital depression or shocklike condition following prolonged anesthesia is largely due to acapnia, and that inhalation of carbon dioxid in air induces a rapid restoration of normal vitality and respiration, and recalls the blood alkali. That evidence and the data presented in this paper together show the reason for the similarity between traumatic shock without hemorrhage and hemorrhage without trauma. It evidently rests in large part on the fact that in both conditions excessive breathing, acapnia and the resulting low blood alkali are involved. These conditions (except after section of the vagi) are always induced also by oxygen deficiency, and constitute a large part of the picture which we term asphyxia.

CONCLUSIONS

1. A standard hemorrhage has been here used under which the chances of recovery and of death are about equal. Several treatments, particularly infusions equal in volume to the blood lost, have been tried. The data show that, although temporarily beneficial, mere restoration of blood volume, even by a fluid approximating the physical properties of plasma, such as acacia solution, does not considerably increase the probability of ultimate recovery. Transfusion of an equal amount of whole blood, after so brief a deprivation as that here used, would result in virtual restoration of normality. The conclusion is therefore drawn that it is the loss of red corpuscles which is the critical factor in hemorrhage.

2. The symptoms and processes observable in a partially exsanguinated animal are found to be identical in many essential features with those under progressive deprivation of oxygen, and with those occurring in carbon monoxid asphyxia. They are like those occurring in the process of acclimatization to great altitudes.

3. Mere visual observation or counting of respiration is quite unreliable. But, when the volume of air breathed per minute is measured, the following important new fact appears: The amount of breathing increases progressively with the blood loss. After the hemorrhage, a decrease of breathing accompanies recovery; and a further increase is an indication of, and a factor in the approach of death. The volume of breathing is thus an index of the severity of hemorrhage and a basis for prognosis.

4. A marked decrease of carbon dioxid content and of alkali in the blood occurs coincidently with the increased respiration. It is shown, by analogy with other forms of asphyxia, that these blood changes are largely due to the acapnial, rather than to the acidotic process. Low blood alkali after hemorrhage calls for transfusion of blood or at least for oxygen inhalations.

5. The similarity of many of the phenomena of traumatic shock and exsanguination is shown to consist in large part in the occurrence in each of the acapnial process, both thus leading to the condition formerly

32. Haggard, H. W., and Henderson, Yandell: J. Biol. Chem. **45**: 199 (Dec.) 1920.
33. Van Slyke, D. D.: Physiol. Rev. **1**: 141, 1921.
34. Henderson, Barringer, Harvey and Haggard (Footnotes 3 and 6); reviewed by Henderson, Yandell; Haggard, H. W., and Coburn, R. C.: The Acapnia Theory, Now, J. A. M. A. **77**: 424 (Aug. 6) 1921.

termed by one of us acapnia, now often erroneously called acidosis, and probably best denominated as a disturbance of the acid-alkali balance of the blood.

6. The circulatory conception of hemorrhage, which assigns the effects to fall of blood pressure, must be supplemented with a respiratory conception, namely, that, through the loss of red corpuscles, hemorrhage is a form of asphyxia.

SPECIFIC PRECIPITIN TEST FOR HUMAN SEMEN *

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Many years ago, C. G. Farnum,[1] at my suggestion, injected rabbits with semen in order to learn whether specific precipitins for semen would develop. This appears to be the earliest experiment of this sort. Farnum found that rabbits injected intraperitoneally with semen or testicular emulsions of dog, bull or man developed specific antisemen precipitins.

Strube [2] also obtained precipitins by injecting rabbits with human semen and testicular extracts, but these precipitins acted on blood serum as well as on semen, and he was not able by means of absorption experiments to secure specific action on semen. H. Pfeiffer [3] injected rabbits with dried and powdered bull spermatozoa, suspended in salt solution; the resulting antiserum acted strongly on semen solutions and testicular extracts, and only feebly or not at all on extracts of other beef organs, and by treatment of the antiserum with beef serum and certain organ extracts all precipitins except those specific for semen could be removed. This treated antiserum caused precipitates in dilutions of bull semen, and detected bull semen in mixtures with organ extracts.

No further experiments appear to have been made on specific antisemen precipitins until the recent work by Dervieux,[4] to which further reference will be made in the discussion of the results of some of my observations.[5]

Samples of human semen from many different men were furnished by Dr. V. D. Lespinasse and Dr. R. D. Herrold, who were good enough to save specimens obtained from private patients in the ways usual for clinical purposes. Of mixtures of such samples, four or five injections were made intramuscularly in rabbits at intervals of three or four days, beginning with 2 c.c. and increasing the quantity by 2 c.c. each succeeding injection. As a rule, the best time to bleed the rabbits for serum was found to be from six to eight days after the last injection. As the antigen in these experiments was not pure semen but mixtures of semen with inflammatory exudations and prostatic secretions, it was expected that the rabbit antiserum would contain precipitins for human proteins generally, whatever the case might be as to precipitins for semen proteins. The general results are illustrated in Table 1, which shows that, in rabbits, injections of mixed human semen obtained as described produce precipitins for human serum and for human semen, and that the precipitins for human serum may be removed by elective absorption, the rabbit serum now containing precipitins specific for human semen only. On the other hand, treatment of the antiserum with semen dilutions removes all precipitins. In other words, my results show that a specific precipitin serum for human semen can be produced. In most of the tests of the antiserum, the absolutely clear fluids (liquor seminis) obtained by centrifugating samples of ejaculated semen were used, and the figures in the table represent the highest dilutions of such seminal fluids and of human serum in salt solution giving positive results under the conditions of the tests. In order to remove the precipitins for human serum proteins, equal parts of antiserum and of dilutions of human serum 1:200 of salt solution are mixed, left at room temperature for about one hour and in the icebox overnight, and then centrifugated thoroughly. Consequently, two volumes of "treated" antiserum represents one volume of the original antiserum. As a rule, the procedure given removes all the precipitin for human serum; dilutions of about 1:200 seems to give the best selective absorption. Progressive dilutions of serum and seminal fluids are made in small, clean glass tubes, and the antiserum, original or "treated," is introduced at the bottom by small pipets so that a precise line of contact of the two fluids is obtained. The results are read after one hour at room temperature.

TABLE 1.—SPECIFIC PRECIPITINS FOR HUMAN SEMINAL PROTEINS IN SERUM OF RABBITS INJECTED WITH HUMAN SEMEN

Serum of Rabbits Injected with Human Semen	Titers of Antiserum in: Human Serum	Human Seminal Fluid	Animal Seminal Fluids (Bull, Boar, Dog, Guinea-Pig, Rabbit, Rat)	Salt Solution
1. Original	6,400	800	0	0
Treated	0	256	0	0
2. Original	3,200	256	0	0
Treated	0	64	0	0
3. Original	6,400	640	0	0
Treated	0	256	0	0
4. Original	6,400	640	0	0
Treated	0	320	0	0
Normal rabbit serum	0	0	0	0

The figures give the highest dilution of serum and seminal fluid in which the antiserum caused distinct precipitates by the layer or contact method after one hour at room temperature.

Numerous tests of spots of various kinds, containing seminal and other protein substances, have been made with antisemen serum, from which precipitins for serum proteins had been removed, that is, with "treated" serum, in order to study its power to detect human seminal proteins under different conditions. Dr. V. D. Lespinasse, Dr. R. D. Herrold and Dr. Willson B. Moody kindly prepared materials for this purpose, the first two using samples of semen and prostatic fluids from patients, and Dr. Moody the contents of the seminal vesicles obtained at postmortem examinations at the Cook County Hospital. The results may be thus summarized: (1) The clear fluid secured by centrifugation of semen—expressed or ejaculated, about forty different samples have been examined—gave positive results in every case in dilutions running from 1:8 to 1:256 or 1:512 of salt solution. (2) In about fifty tests of blood, serum, pus, ascites fluid, soap, sputum and seminal-prostatic fluids, dried on cotton

* From the John McCormick Institute for Infectious Diseases.

1. Farnum, C. G.: Biologic Test for Semen, J. A. M. A. **37**: 1721 (Dec. 28) 1901; Tr. Chicago Path. Soc. **5**: 31, 1901.
2. Strube, G.: Beitr. z. Nachweiss von Blut und Eiweiss auf biologische Wege, Deutsch. med. Wchnschr. **28**: 425, 1902.
3. Pfeiffer, H.: Beitrag. sur Lösung des biologisch forensischen Problems der Unterscheidung von Sperma-eiweiss gegenüber andern Eiweissarten derselben Species durch die Präzipitinsmethode, Wien. med. Wchnschr. **18**: 637, 1905.
4. Dervieux, M.: Procede de diagnostic individuel du sang et du sperm; Compt. rend. Adad. d. Sc. **172**: 1384, 1921.
5. A comprehensive consideration of the immune reactions of the sexual cell is given by Dunbar, W. P.: Ueber das serobiologisch Verhalten der Geschlechtzellen, Ztschr. f. Immunitätsforsch. u. exper. Therap. **4**: 740, 1910; **7**: 454.

cloth, the treated antisemen serum gave positive reactions with the extracts in salt solution only of the spots containing seminal-prostatic fluids, either pure or mixed with blood and pus, with these exceptions: The extract of a spot made with soap gave a nonspecific reaction; the extract of a spot made by fluid expressed from the prostate in an old man, the fluid not containing any spermatozoa, did not give any reaction; and, finally, a faint reaction was obtained with the extract of a spot made with fluid from a joint the seat of gonococcal arthritis. As the antigen was a mixture of seminal fluids, gonococci or gonococcal proteins may have been present and have induced the formation of antigonococcal precipitins; at any rate, treatment of this particular antiserum with gonococcal antigen removed the precipitin for the fluid of gonococcal arthritis without disturbing the precipitin for seminal protein. Extracts in salt solution of the seminal stains from nocturnal emissions gave prompt reaction. The results indicate that antiserum for human semen may be of practical value in detecting by its specific precipitin reaction the presence of human seminal protein in suspected spots and stains.

It is of special interest to note that the precipitin reaction for semen not only seems to be specific for the species but also, so to speak, semen-specific, that is, limited to constituents of the semen of that species. Whether the narrow limitation of action of human antisemen precipitins will hold true without exception and whether other precipitin reactions of an equally limited specificness and hence also of possible diagnostic value are to be found can be determined only by further and more extended observations. The more exact nature and source of the specific element or elements in human semen also invite investigation. It may be stated now that extracts of carefully washed spermatozoa give precipates with antisemen serum.

Experiments with boar semen have yielded results analogous to those with human semen, as shown in Table 2, but in this case a small amount of precipitin for rat semen developed also. Observations with the semens of other species are projected.

On the basis of tests with serums obtained by injections of rabbits with the semen of one person, Dervieux [4] ventures to claim even an individual specificness, such serums giving the strongest reactions with the particular semen used as the antigen; but his methods are open to question and his assertion that the precipitins for human blood do not act on human semen certainly cannot stand, because I find, as did Uhlenhuth [6] long ago, that the serum of rabbits injected with human blood or serum proteins regularly causes precipitates in human semen in low dilutions (from 1:8 to 1:54).

TABLE 2.—SPECIFIC PRECIPITINS FOR BOAR SEMINAL FLUID

Serum of Rabbit Injected with Boar Semen	Titers of Antiserum in			
	Swine Serum	Boar Seminal Fluid	Rat Seminal Fluid	Other Seminal Fluids (Bull, Dog, Guinea-Pig, Human, Rat, Rabbit)
Original	400	32,000	32	0
Treated	0	8,000	8	0
Normal rabbit serum	0	0	0	0

The figures give the highest dilution of serum and seminal fluid in which the antiserum caused precipitates after one hour at room temperature.

6. Uhlenhuth: Weitere Mitteilungen über die praktische Anwendung meiner forensische Methode zum Nachweiss von Menschen und Thierblut, Deutsch. med. Wchnschr. **27**: 499, 1901; der forensische Blutnachweiss, Wien. med. Wchnschr. **54**: 2009, 1904.

SUMMARY

Injection of rabbits with human semen induces the formation of precipitins that are specific for human seminal proteins, and this precipitin reaction may prove of value in determining the nature of spots suspected to be of seminal nature.

THE MOTOR ACTIVITY OF THE VENAE CAVAE *

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The question as to whether the establishment of a definite peripheral resistance requires active variations in the size of the venous blood-bed has been discussed repeatedly. In general, it may be stated that the resistance encountered by the arterial blood in its passage through the vascular system depends on: (*a*) the size of the arteriocapillary orifice as determined by vasomotor action; (*b*) the size of the capillary blood-bed, and (*c*) the viscosity of the blood. The second factor, in turn, embraces the tonicity and contractility of the lining cells of the capillaries as well as of those smooth muscle cells which are scattered through the deeper layers of the skin in the immediate vicinity of these delicate tubules. It is obvious that the size of the capillary blood-bed may be varied not only in an active manner by changes in the contractility of the walls of the capillaries, but also in a passive way by the pressure exerted by neighboring tissues on their outer surfaces.

This subject-matter has been amplified in recent months by assuming that the walls of the veins and venules change their positions not solely in accordance with the height of the venous pressure but also in an active manner in consequence of motor influences. It is not my intention to review the literature pertaining to this entire topic, but merely to inquire into the question whether or no the venae cavae are equipped with a motor mechanism. Hill [1] has noted that the intravenous administration of extract of suprarenal body in a dog with divided vagus nerves gives rise to a considerable increase in the arterial pressure, but does not affect the pressure in these central veins. Contrariwise, Plumier [2] has observed that this procedure, when repeated in the intact animal, produces a rise in venous pressure which may justly be attributed to the slowing of the heart evoked by the injection of the aforesaid agent. A similar explanation of this phenomenon is given by Capps and Mathews.[3] This hindrance to the transfer of the venous blood into the arteries is usually referred to reflex cardio-inhibition, because the division of the vagus nerves or the administration of atropin destroys the rise. In this connection, brief reference should also be made to the fact that the injection of epinephrin solution in normal and abnormal persons evokes, as a rule, an increase in the pulse rate.[4]

Connet [5] takes issue with the conclusions drawn from the preceding experiments, because the results do not show that the reduction in the cardiac frequency is

* From the Physiological Laboratory of Columbia University.

1. Hill: Proc. Roy. Soc. **46**: 478, 1900.
2. Plumier: Arch. internat. de physiol. **8**: 1, 1909.
3. Capps, J. A., and Mathews, S. A.: Venous Blood Pressure as Influenced by the Drugs Employed in Cardiovascular Therapy, J. A. M. A. **61**: 388 (Aug. 9) 1913.
4. Donaldson: Brit. M. J. **1**: 476, 1914. Miller: Lancet **2**: 158, 1914.
5. Connet: Am. J. Physiol. **54**: 96, 1921.

the only factor responsible for the rise in venous pressure. In order to rule out the slowing of the heart, the vagus nerves were cut. The arterial and venous pressures were registered, the latter by means of cannulas inserted through the external jugular and femoral veins into the superior and inferior venae cavae. On injecting a solution of epinephrin into the circulation, the usual result was a rise in the arterial and venous pressures. These rises persisted even after precaution had been taken to retain the minute-volume of the heart as nearly as possible at its normal value. While these results were not very conclusive in dogs, they were quite definite in decerebrate cats. Thus, the rise in venous pressure persisted even after both vagus nerves had been divided, and when the cardiac frequency remained practically the same and the minute-volume had been increased by augmenting the pulse pressure. The conclusion finally arrived at by Connet is that the rise in venous pressure is due in large part to a nervous factor, resident, as is shown by a subsequent series of experiments, in the venae cavae and not in the central nervous system.

It is obvious that the frequency of the heart as such cannot be the deciding factor in the production of this rise in venous pressure, because a quickly beating heart need not propel a larger quantity of blood in a given period of time than one beating more slowly. Accordingly, it must be the output of the heart per unit of time that determines the functional capacity of this organ, and in turn influences the venous flow and pressure. It is not apparent to me that Connet has properly guarded these experiments against changes in the blood flow.

The variations which this factor presents under the influence of epinephrin may be ascertained by calibrating the blood stream in the inferior or superior vena cava. The method that may be followed in experiments of this kind has already been described.[6] In brief, it necessitates the insertion of a recording current-measurer[7] in the inferior vena cava in close proximity to the right auricle, as well as the simultaneous registration of the carotid and caval pressures over the records of a chronograph and electromagnetic signal. It is then possible to inject different quantities of a 1:10,000 solution of epinephrin into the circulation to ascertain the action of this agent. In the experiments under consideration, the injections were made into the femoral vein on the corresponding side, or into the inferior vena cava very close to the right auricle. These tests were repeated after both vagus nerves had been divided. Cats in light ether narcosis were employed.

The character of the results of these experiments may best be illustrated with the aid of the accompanying table, which embodies the numerical values of the blood flow and pressures of a section of Experiment 8. It will be seen that the normal caval flow amounted in this case to 2.97 c.c. in a second, while the carotid arterial pressure equaled 102.6 mm. of mercury and the venous pressure 1.5 mm. About six seconds after the injection of 2.0 c.c. of a 1:10,000 solution of epinephrin, the arterial pressure rose slowly until it attained a height of 130.6 mm. of mercury. The frequency of the heart retained its normal value for some time after the onset of this rise, and then slowly decreased from 176 to 162 a minute. The greatest reduction in the cardiac rate coincided with the period of maximal arterial pressure. At this moment, a marked diminution in the second-volume of the venous flow developed, which persisted during the entire period of high arterial pressure. The venous pressure showed a maximal value of 2.2 mm. of mercury.

The general character of these changes, as well as the relationship in the time of their development, leads me to believe that the rise in venous pressure following the injection of epinephrin is not of local origin, but is due to the establishment of a high peripheral resistance. The latter, in turn, diminishes the minute-output of the heart. In other words, it is not caused by a constrictor action of the central veins but by a slight mechanical impediment to the transfer of venous blood into the arteries. Accordingly, it seems that the results of the experiments of Connet cannot possibly be interpreted as proving that the venae cavae are equipped with a motor mechanism.

RESULTS OF AN EXPERIMENT*

Phase of Stromn hr	Time, Sec.	Total Quantity of Blood, C.c.	Quantity, per Sec.	Blood Pressure, Mm. Hg: Carotid Artery	Blood Pressure, Mm. Hg: Inferior Vena Cava	Procedure
15	6.3	19.5	3.09	102.6	1.5	Normal
16	6.5	19.5	3.00	.....	...	
17	6.4	19.0	2.97	.....	...	
18	6.5	19.0	2.92	.....	...	
19	6.3	19.0	3.01	.....	...	
20	7.0	20.0	2.85	.....	...	
Average			2.97	102.6	1.5	
21	6.8	20.0	2.90	102.8	1.5	Injected 2 c.c.
22	6.5	20.0	3.07	114.6	...	of solution of
23	6.9	20.0	2.89	119.4	2.0	epinephrin
24	7.4	19.5	2.63	1,264	2.2	1:10,000
25	8.0	19.5	2.43	130.6	...	
26	8.0	19.5	2.43	120.0	...	
27	7.2	19.5	2.70	116.3	2.0	
28	7.0	19.8	2.82	110.2	...	
29	7.0	19.8	2.82	104.6	1.5+	
30	7.0	19.5	2.78	103.5	...	
31	6.8	19.5	2.86	.....	...	
32	7.0	20.0	2.85	103.0	...	
33	6.5	20.0	3.07	.....	1.5—	
34	6.5	20.0	3.07	.....	...	
35	6.4	19.8	3.09	102.0	...	
36	6.4	19.8	3.09	.....	...	
37	6.5	19.8	3.04	.....	...	

* Experiment 8: Cat, weight, 4 kg. (8 9/10 pounds); heart, 20 gm.; frequency, 176 a minute.

Stress is laid by Connet on the fact that the rise in venous pressure following the administration of epinephrin persists even after both vagus nerves have been divided. Since this procedure prevents cardiac reflexes, and establishes at the same time a greater cardiac output per minute, it is believed that the augmentation in venous pressure must possess a local cause. The experiments here submitted do not confirm this contention, because the division of the aforesaid nerves did not destroy the effects of the epinephrin as exemplified by the hindrance to the venous flow into the right auricle and the rise in venous pressure. Accordingly, they cannot be employed as a means of showing that the venae cavae possess motor powers.

The passive behavior of the cavae is further illustrated by the changes resulting under these experimental conditions in consequence of the injection of epinephrin into the femoral vein, i. e., distally to the current-measurer. In the presence of venoconstrictors in the cava, this slight change in the procedure should markedly diminish the venous flow into the heart. The latency of the rise in venous pressure should then be brief, while the character of the changes in the flow should indicate a peripheral reduction in the venous supply. Contrariwise, the results of these tests revealed

6. Burton-Opitz, Russell: Am. J. Physiol. **58**: 226, 1921.
7. Burton-Opitz, Russell: Arch. f. d. ges. Physiol. (Pflüger's) **121**: 150, 1908.

a diminution in the functional capacity of the heart brought about by the increased peripheral resistance. The period elapsing between the moment of injection of the epinephrin and the onset of the rise in venous pressure and decrease in the blood flow was unduly prolonged. Naturally, this increase in the length of the latent period finds its cause in the time consumed by the epinephrin in its passage through the distal portion of the inferior vena cava and the instrument measuring the volume of the blood stream. Accordingly, as the aforesaid changes did not develop until the epinephrin had had sufficient time to enter the arterial system, they cannot be indicative of the presence of a motor mechanism in the central segments of the venae cavae.

EFFECTIVENESS OF INFANT WELFARE CLINICS FROM A MEDICAL POINT OF VIEW*

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The large amount of public, professional and governmental interest in child welfare work which has developed in recent years has been manifest more in the philanthropic than in the medical aspects of the problem; propaganda and organization rather than medical service have been stressed. Doubtless, in pioneer work these were the logical methods of attacking this public health problem; but infant welfare work is not only a philanthrophy. It is also preventive medicine in diseases of children, and only as it is medically effective should it command encouragement and support as a social benevolence. As a measure of this effectiveness, a statistical study of the records of the Babies' Milk Fund Association of Baltimore for 1920 is offered.

Infant mortality rates vary from year to year from causes and conditions more or less well understood, and local or national in scope. These fluctuations in the infant death rate from year to year appear to have occurred in some localities before the days of awakened interest in child welfare work. Furthermore, it is difficult, taking any large group of figures compiled by many persons whose personal equations must necessarily be different and from localities whose statistical methods and accuracy are not comparable, to be sure that a change in the infant mortality rate is due to the accomplishment or to the lack of any given piece of public health work. These varying factors have been largely eliminated in this study. The comparisons were made between groups of children all within one organization; the period studied was one calendar year, and the personal equation only that of the medical superintendent of the association. The demonstration of the effectiveness of public health work depends on an analysis of vital statistics, but we believe that unselected morbidity and mortality reports have much less significance than the data which may be obtained from the study of a group of cases under uniform known conditions.

Children are enrolled by the Babies' Milk Fund Association of Baltimore up to the age of 3 years. The children are referred to the association by various individuals, organizations, institutions and the department of health. To all of the children the association gives nursing supervision and instruction in the home; it offers to these children the services of its "well baby" clinics, but attendance at these conferences is not required for enrolment. Hence the association obviously has two groups of children on its roll: (1) those who receive from it only the services of the visiting nurses, and (2) those who in addition receive directions as to feeding and hygiene at an infant welfare conference from a physician whose work is actively supervised by the medical superintendent of the association.[1] These two groups present themselves for comparative study as regards the death rates in each. The association does not furnish medical service to sick children, and the diagnoses of the causes of death were obtained from various sources—attending physicians, institutions and certificates of death. These diagnoses were entered on the charts; the charts also furnished in all cases notes by the nurses and also by the conference physicians if the child was an attendant at a "well baby clinic" prior to its sickness and death. These charts were the sources from which were obtained the statistics on which this study is based.[2]

GENERAL DATA

During the year 1920 there were 13,036 children under 3 years of age enrolled in the Babies' Milk Fund Association of Baltimore. Of these, 8,730 (66 per

* From the Babies' Milk Fund Association of Baltimore, J. H. Mason Knox, Jr., president.

1. The medical superintendent and the clinic physicians of the association received salaries for their services. Budin, who inaugurated the welfare conference, "has well said that the consultation is worth just as much as the physician who conducts it, but no more" (Holt, L. E.: Infant Mortality, Ancient and Modern: An Historical Sketch, Tr. Am. A. for Study and Prevention of Infant Mortality, Fourth Annual Meeting, Washington, D. C., 1913, p. 45). Of the truth of this assertion we have not the slightest doubt. In 1920 there were twenty-six welfare conferences each week. The stations at which the clinics were held were widely distributed in the city. At some stations two clinics were held each week; at others only one. There were nine clinic physicians. The medical advice given a mother at a "well baby" clinic cannot be sharply defined; it is often adapted to the individual baby rather than to a group. Some points regarding feeding instructions may be detailed:

1. The feeding interval advised was four hours—occasionally three hours, but never less.

2. After each feeding the mother was instructed to place the child over her shoulder and pat the child's back so that gas in the stomach might be eructated with the child in the upright posture. Vomiting other than that due to hypertrophic stenosis or neurosis (rumination) was rarely observed at the clinics. The mothers seldom complained that their infants had severe colic.

3. Unsweetened boiled water was prescribed between feedings.

4. Breast feeding was insisted upon up to the eleventh month. A formula was never prescribed until it had been demonstrated by the weight curve, by the weight before and after nursing, and by examination of the mother's breasts that the supply of human milk was nil or insufficient. If any breast milk was available, it was used, and complemental or supplemental artificial feedings employed. The value of milk and a plain, well balanced diet for the lactating mother was emphasized.

5. The artificial formulas prescribed were for the most part simple water or barley water dilutions of whole milk with the addition of sucrose. After mixing, the formulas were brought to the boiling point and kept at that temperature for several minutes and then cooled rapidly. Because of inaccuracy, the practice of preparing single feedings was discouraged. The nipples and bottles from which the child was fed were to be sterilized by boiling. Special milk was not dispensed by the association. Mothers were taught in their homes by the nurses how to modify the milk delivered there by the dairy. The nurses always followed a physician's orders; under no circumstances did the nurses prescribe formulas.

6. Cereal in solid form was advised after the child was 6 or 7 months old; also small amounts of vegetable purée or broth.

7. Simple printed diet lists for children over 10 months of age were available. The use of plain, well balanced diets was urged, and no attempt made to give a wide variety of foods.

8. After the third month, biweekly and, if possible, daily administration of orange juice was advised.

9. Cod liver oil was prescribed for all rachitic children and for most of the colored children after they were 4 months of age..

2. Certain children moved from the city, and others were discharged for various reasons before reaching the age of 3 years; the addresses of still others were lost. Of these children a certain number died, and their deaths could not be recorded on our records. These unknown deaths, when added to the known deaths, would increase the actual percentage mortality but would not change the relative percentage, for they were in all probability about equally distributed in Groups 1 and 2.

cent.) were white children, and 4,306 (33 per cent.) were negroes. All of these children were under the supervision of nurses, but we arbitrarily regarded only those who were brought to the "well baby clinics" at least three times as being under our medical supervision; these children constitute Group 1. We felt that, if a child was brought to a conference at least three times, it could fairly be assumed that the child was being cared for, to some extent at least, as our physician had directed. Of course, some of the children

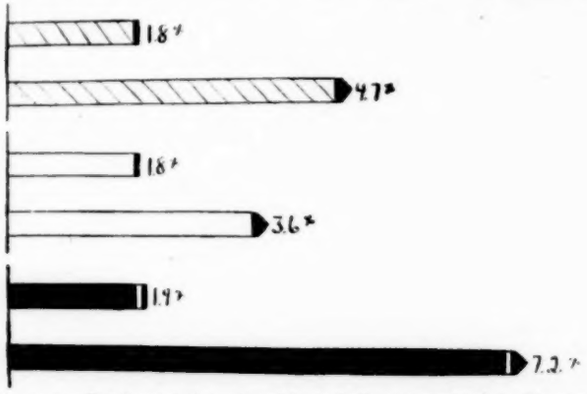

Chart 1.—Total mortality. In this and the accompanying charts the blocks with square tips represent the percentage of deaths among children "under medical supervision" (Group 1); the blocks with pointed tips represent the percentage of deaths among children "not under medical supervision" (Group 2.) The shaded blocks (with oblique lines) represent the percentage of deaths among white and colored children together; the white blocks and the black blocks, the percentage of deaths among white children and colored children, respectively.

who did not attend our clinics received some medical supervision from private physicians or from dispensaries. Those children who were never brought to a clinic or who were brought less than three times were

PRELIMINARY DATA *

Children under 3 years of age, visited:		
13,036	4,366 (33%)	under medical supervision
	8,670	not under medical supervision
White, 8,730	2,673 (30%)	under medical supervision
	6,057	not under medical supervision
Colored, 4,306	1,693 (39%)	under medical supervision
	2,613	not under medical supervision

*The children "under medical supervision," whether white and colored together, or white or colored separately, constitute Group 1. Those "not under medical supervision," whether white and colored together, or white or colored separately, constitute Group 2. The children "under medical supervision" are those who were brought to the infant welfare conferences of the association at least three times; those "not under medical supervision" are the children who never came to the infant welfare conferences at all or who came less than three times.

not regarded as being under the medical supervision of the association, although they were regularly visited by the nurses; these children constitute Group 2. Of the 13,036 children enrolled, 4,366 (33 per cent.) were under both medical and nursing supervision (Group 1), and 8,670 (66 per cent.) were under nursing supervision only (Group 2). Of the white children, 2,673 (30 per cent) belonged in Group 1 and of the negroes, 1,693 (39 per cent.) belonged in Group 1.[3] The basic preliminary data are summarized in the accompanying table.

3. The notation "Group 1" refers not to a fixed number or set of infants, but always to those children who came to the conferences at least three times; sometimes the group is composed of white and colored children together, sometimes of white children only, and sometimes of negro children only. Similarly, "Group 2" is sometimes composed of white and colored children together, sometimes of white children only, and sometimes of negro children only.

Few infants were brought to the welfare conferences before they were 6 weeks of age. This was due in part to the fact that mothers often do not wish to take very young babies outdoors, and in part to the fact that the maternity agencies often followed the babies for several weeks, and it is difficult for the "baby nurse" to obtain complete cooperation so long as the family is being visited by the representatives of several organizations. Relatively few children were brought to the clinics after they were 18 months of age. With an inadequate staff of nurses,[4] it was deemed best to concentrate effort on children under 1 year of age. Many mothers will not bring their children to conferences, after the first year is successfully passed, without constant prodding and encouragement.

TOTAL MORTALITY

In a study of the total mortality of the white and negro children together, it was found, as shown graphically in Chart 1 that in Group 1 the deaths per thousand children in the group (4,366) were eighteen, whereas in Group 2 (8,670 children) they were forty-seven. When the total mortality for the white and negro children was studied separately, it was found that in Group 1 of the white children (2,673) the deaths were eighteen per thousand, and of the negroes (1,693 children) they were nineteen per thousand; in Group 2 of the white children (6,057) the deaths were thirty-six per thousand, and of the negroes (2,613 children) they were seventy-two per thousand. The mortality, therefore, of the white children under medical supervision was about one-half that of those receiving only nursing supervision. For the negroes, the mortality of those coming to the clinics was only one-fourth that of those who did not come. The greatest reduction in mortality obviously took place among the colored children; this result is even more striking when it is pointed out that the general death rate for colored children in Baltimore is about double that for white children.

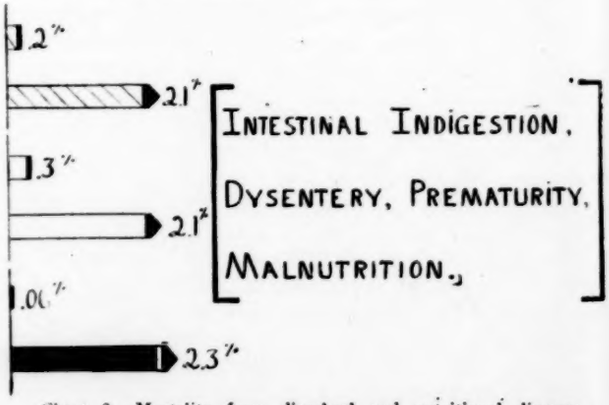

Chart 2.—Mortality from diarrheal and nutritional diseases.

We believe that this reduction in deaths was in large measure the result of our medical supervision; but, undoubtedly, without our work the mortality in Group 1 would have been somewhat less than in Group 2 because the mothers who brought their children for medical supervision were cooperative and probably more intelligent than those who did not come; without our help, therefore, the child of the intelligent mother might have been somewhat better protected from dis-

4. The number of field nurses on the staff in 1920 was twenty-three. The number of children on the roll at any given time was about 8,000.

ease than the child of the less careful and resourceful woman. Our clinics for colored children were very popular, and undoubtedly the mothers who brought their babies were of the more intelligent and prosperous class.

MORTALITY FROM DIARRHEAL AND NUTRITIONAL DISEASES

In Chart 2 is shown graphically the result of a study of deaths due to difficulties in feeding and to diarrheal diseases. In order that this study should err, if any error were to be made, on the side of showing the effectiveness of medical work in the least favorable light, it was necessary to include in this group every death which could reasonably be thought to be due to improper or difficult feeding, or to actual disease of the gastro-intestinal tract. Included in this group, therefore, are deaths from states or diseases diagnosed as prematurity, marasmus, malnutrition, athrepsia, gastro-enteritis, intestinal indigestion, summer complaint, ileocolitis, dysentery and infectious diarrhea. The study shows that the total deaths from these diseases were two per thousand children in Group 1 (4,366), as compared with twenty-one per thousand in Group 2 (8,670 children).

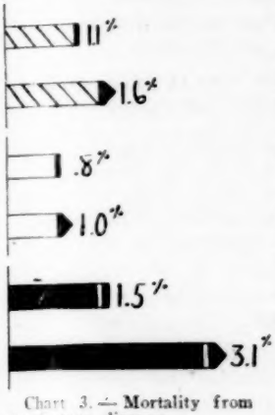

Chart 3. — Mortality from respiratory diseases.

This chart also shows separately the mortality among white and colored children from nutritional and diarrheal diseases. The number of deaths among the negro children who did not attend the clinics was nearly forty times greater than among those who received medical supervision at the conferences. We are at a loss to give a positive explanation for the fact that the death rate in Group 1 of the negro children was lower than in Group 1 of the white children, but it is our impression that we were more successful, for reasons economic, racial or otherwise, in securing breast feeding for colored children than for white children.

We were able to attribute to dysentery but one death among the children who were under our medical supervision. Our nurses and physicians constantly teach that all water and food given to a baby must be boiled, and that all utensils in which the infant's food or water is kept must be sterilized. Small amounts of orange juice daily or two or three times weekly were prescribed for artificially fed children after the third month.

MORTALITY FROM RESPIRATORY DISEASES

The medical advice given at a "well baby" conference can supposedly accomplish little in the prevention of respiratory diseases, except to assist the mother in keeping the child in good nutritional condition. It was expected, then, that deaths from respiratory diseases (certified as "bronchitis," "pneumonia," "influenza," "pulmonary tuberculosis") would only be slightly fewer among the children under our medical supervision (Group 1) than among those without our medical supervision (Group 2).

Chart 3 demonstrates that, as regards the children as a whole and as regards the white children, the actual results correspond to those anticipated, i. e., the deaths in Group 1 were only slightly fewer than those in Group 2. But the deaths of negro children in Group 1 were only one-half those in Group 2. The accepted belief in the increased susceptibility of the negro race to respiratory diseases might account for the increase of deaths in Group 1 of negro children (15 per thousand) over those of Group 1 of the white children (eight per thousand), but it was not expected that in Group 1 of the negro children the deaths would be only one-half as many as among the children in Group 2.

We believe that there is a definite explanation for this striking but unexpected reduction in deaths from respiratory disease among negro children who attended "well baby" conferences fairly regularly. Since 1916, it has been the practice of the conference physicians to prescribe cod liver oil to most of the negro babies over 3 or 4 months of age and, of course, to all children with manifest rickets. The result of this use of cod liver oil as a preventive medicine for rickets is, we believe, shown in the lower death rate among the clinic babies, for rickets is an extremely prevalent disease among negro children, and the chief cause of death among rachitic infants is respiratory infection; hence, a reduction in the incidence of rickets manifests itself very strikingly in a reduction of the deaths due to infections of the respiratory tract.

MORTALITY FROM MISCELLANEOUS CAUSES

Of all other causes of death in the first three years of life, only the infectious diseases offer large opportunity for preventive work, and of these only for smallpox, diphtheria and syphilis have we definite prophylactic or remedial agents. Doubtless it would be expected that improvement in general nutrition might bring about a slight reduction in the number of deaths from miscellaneous causes among the children who came to the conferences. The striking feature of Chart 4 is the reduction in the deaths among negro children coming to the conferences, these being one sixth of those occurring among the children who did not attend the clinics. Here again, in retrospect, we believe there is a definite explanation for the reduction in the death rate. Hereditary syphilis, like rickets, is very common among negro children, and in our clinics children of this race were watched carefully for the slightest signs of the disease. Children in whom syphilis was suspected or diagnosed were immediately sent for blood studies and treatment to physicians or hospital clinics. Many babies were thus doubtless saved who would otherwise have died during the course of the first year from active syphilis and secondary malnutrition.

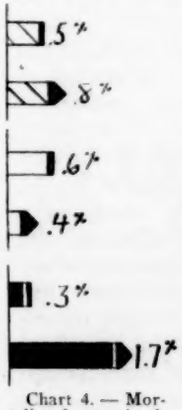

Chart 4. — Mortality from miscellaneous causes.

RESULTS OF STUDY

We believe that this study has convincingly shown how very effective the application of pediatrics may be in preventing deaths among children in the first three years of life. By the promotion of breast nursing and the use of simple but carefully adapted artificial formulas, nutritional and diarrheal diseases and difficult feeding problems are practically eliminated.

Although there were many cases of dysentery in Baltimore during the year 1920,[5] there were few cases among the regular attendants of the welfare conferences, and we were able to attribute only one death to this disease in this group of children. We believe that dysentery did not occur among the children under our medical supervision, because, whenever artificial feedings were used, the mother was taught to boil the formula and the vessel or bottles in which the formula was kept. There may be other causes for the elimination of dysentery among the group of children under our medical supervision, but we believe that sterilization of food and utensils is the correct one, for it is the one practice which we most frequently found had not been followed in cases in which dysentery did develop.

Feeding difficulties, summer complaint and dysentery then, are causes of death in infancy which can be controlled or eliminated among a large group of children who are visited in their homes by nurses, and whose feeding and hygiene are supervised by physicians trained in pediatrics. To a lesser degree, respiratory disease may be lessened by the promotion of good nutrition and thereby increased resistance to and endurance of infection. Furthermore, rickets is a preventable disease, and death due to respiratory disease in rachitic children is entirely preventable.

Diphtheria, syphilis and smallpox similarly as causes of deaths are preventable diseases. All that we were able to accomplish in the reduction of deaths from diphtheria was through the early diagnosis of the disease and insistence on antitoxin treatment of it. But a widespread use of toxin-antitoxin immunization, in conjunction with the Schick test, would far more effectively reduce the morbidity and mortality from this disease. Adequate prenatal supervision will result in the administration of suitable treatment to pregnant syphilitic women, and the incidence of hereditary syphilis will be markedly reduced thereby. The early diagnosis and treatment of hereditary syphilis will almost eliminate this disease as a cause of infant deaths. Smallpox, which was at one time perhaps the most potent cause of infant mortality, has ceased to be of serious moment since the practice of vaccination has become widespread.

We believe that the same careful methods of nursing and medical supervision, if applied to infants in the first month or six weeks of life, would result in a reduction in the deaths from certain diseases of the new-born and the prevention of the development of many difficult feeding problems which are later presented to the pediatrician for solution. Similar means would doubtless reduce the death rate in the preschool period, but more especially the incidence of maldevelopment and chronic diseases.

CONCLUSIONS

1. Standardized medical supervision of children, under 3 years of age, in conjunction with careful home visiting and instruction by nurses, is highly effective in reducing mortality.

In 1920, 13,036 children under 3 years of age were enrolled in the Babies' Milk Fund Association of Baltimore. Children who were brought to the infant welfare clinics of the association at least three times constitute Group 1 (4,366 children, both white and colored); those who were brought less than three times or not at all constitute Group 2 (8,670 children, both white and colored).

The general mortality for both white and negro children together in Group 1 was eighteen per thousand, as compared to forty-seven per thousand in Group 2.

The greatest relative reduction in the number of deaths occurred in the negro children; the mortality in this race in Group 1 (1,693 children) was nineteen per thousand, and in Group 2 (2,613 children) was 72 per thousand.

2. The reduction in the death rate is most striking in malnutrition, summer complaint and dysentery.

The deaths of white and colored children together from these diseases was two per thousand in Group 1 and twenty-one per thousand in Group 2. In Group 2 of the negro children, the mortality was forty times greater than in Group 1, in which its was only 6 per 10,000. Only one death in Group 1 was attributed to dysentery.

3. Deaths from respiratory infections in children under 3 years of age may be slightly reduced by the promotion of good nutritional development. In negro children the prevention of rickets by the use of cod liver oil reduces the incidence of respiratory diseases.

The total mortality of white and colored children together from respiratory tract infections was eleven per thousand in Group 1 and sixteen per thousand in Group 2; eight per thousand in Group 1 of the white children (2,673 children) and ten per thousand in Group 2 (6,057 children); and fifteen per thousand in Group 1 of the negroes and thirty-one per thousand in Group 2. We believe that this marked reduction in the deaths among colored children from respiratory diseases parallelled a reduction in the incidence of rickets accomplished by the prophylactic use of cod liver oil.

4. Of other diseases causing death in infancy, diphtheria and syphilis offer the greatest opportunities for the application of preventive and curative measures.

The mortality for white and colored children together from miscellaneous diseases was five per thousand in Group 1 and eight per thousand in Group 2. There was, however, a real reduction in the number of deaths among negro children; in Group 1 of the colored children the mortality was three per thousand, whereas in Group 2 it was seventeen per thousand. We believe this reduction was accomplished chiefly through early recognition and treatment of hereditary syphilis; in Baltimore this disease seems to be relatively much more common among colored than among white children.

5. One of the most valuable services a nurse engaged in public health work can contribute to the cause of the prevention of disease and death in children is to teach mothers to keep their children under competent medical supervision.

5. It is not possible at this time to determine in Baltimore the exact rôle played by dysentery as a cause of death in childhood. The cases of bloody diarrhea are classified with all other forms of so-called summer complaint as "gastro-enteritis." We believe that a large percentage of cases of so-called "ileocolitis," "bloody diarrhea" or "infectious diarrhea" in infants are proved to be due to bacterial infection, usually with the dysentery bacillus (Davison, W. C.: Bacillary Dysentery in Children, Bull. Johns Hopkins Hosp. **31**: 225 [July] 1920). Bloody diarrhea should be a reportable disease as are other infectious diseases, and statistics of deaths due to this infection should be kept separately from those of deaths due to other nonspecific forms of diarrhea in children.

Opinion on Quarantine from Attorney General.—According to an opinion given by Attorney General Brundage of Illinois it is within the power of the state department of public health to declare that a state of limited quarantine exists in any municipality where an epidemic of smallpox has appeared or threatens to develop and that under the terms of such limited quarantine it would be legal to require all persons about to travel on common carriers to produce evidence of protection against smallpox, either by reason of vaccination or of having had the disease. The opinion further states that the enforcement of such regulations can legally be required from local health authorities. The opinion of the attorney general in this matter came as a result of a request from the state director of public health who had some such action under contemplation because of lax quarantine conditions at certain points where smallpox has been more or less epidemic for the past few months.

OBSERVATIONS ON CLINICAL AND THERAPEUTIC ASPECTS OF CHRONIC INTERNAL HYDROCEPHALUS *

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AND
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The keen interest manifested in recent years regarding the etiology, pathology and treatment of hydrocephalus, excluding the acute type (tuberculous meningitis), has stimulated us to review the literature and to attempt to carry out some of the therapeutic measures outlined by Frazier,[1] Dandy,[2] Blackfan [3] and Elsberg.[4] Of the cases coming under our observation we have selected types suitable for the purpose.

Reviewing the etiology, we noté Dana's [5] statement that secondary or acquired hydrocephalus is usually caused by an attack of acute meningitis or by tumors; but it may also be due to ependymal inflammation, and to obstruction of the veins of Galen by thrombosis or other mechanical causes. In some cases infants survive the meningitis, and, with a growing head, develop symptoms of hydrocephalus. Blackfan [3] states that in a series of cases which he recently studied, the primary cause of chronic hydrocephalus was a previous meningitis in fourteen; a congenital absence of the aqueduct of Sylvius in three, and a tumor blocking the iter in one. Oppenheim [6] says of acquired hydrocephalus that the latent type may in childhood, youth, or even in adult life, become aggravated, either spontaneously or as the result of injury, sunstroke, etc., and by rapid and marked increase of the ventricular exudation give rise to serious symptoms. We note [7] further that:

> Internal hydrocephalus resulting from serous effusion, as a rule, comes on in early childhood, and is not difficult to recognize if the process is active. Very often, however, there may be only mild symptoms, only to have later in life either an acute or a chronic serous meningitis or internal hydrocephalus. Many writers consider that serous meningitis or serous effusion in the ventricles in the adult is only an acute exacerbation of an old process which had its origin in childhood. However that may be, there is no question but that in the adult a serous effusion may develop either acutely or gradually in the ventricles and cause symptoms which are usually recognized as occurring in brain tumor and from which it is almost impossible to make a differential diagnosis.

In proceeding with this work we have followed the new classification of Frazier,[1] which we found well adapted for clinical purposes. Our cases have been arranged accordingly.

The first case presented falls under the heading of hydrocephalus obstructivus, the internal hydrocephalus of the old nomenclature. In this type there is mechanical obstruction to the natural drainage of cerebrospinal fluid from one or more ventricles into the subarachnoid space, where the absorption takes place. This may be due to a congenital defect, such as absence of the aqueduct of Sylvius, or as the result of adhesions from a previous inflammatory lesion. In other cases the passage of fluid through the foramina of Magendie and Luschka may be obstructed, causing a dilatation of all the ventricles. This case is illustrative from the standpoint of operative procedures as therapeutic measures:

CASE 1.—*History.*—T. B., a colored boy, aged 5 years, first admitted, April 12, 1920, a sixth child, was born at full term, of apparently healthy parentage; delivery was normal; the birth weight was not recorded. The family history was negative. The child had been breast fed for one year, followed by gradual feeding of table food. Four days after his birth the mother noticed that the head appeared to be increasing in size. For a period following this the head became progressively larger, the child was unable to hold it up, and mental development was markedly retarded. At the time of admission he could speak only a few words, and his general physical condition was poor. The chief complaint on admission was convulsions for the last two days, occurring at frequent intervals, and always generalized.

Physical Examination.—The child was poorly developed and poorly nourished. He lay in bed with the limbs drawn up and crossed, the eyes rolled upward, and he groaned continuously. The head was very large, measuring 24 inches (61 cm.) in circumference. The anterior fontanel was widely open and the bones were very thin. The eyes showed a marked lateral strabismus with some degree of exophthalmos. The pupils were equal and regular, and reacted to light. The ears and nose were normal. The teeth were in poor condition; the tongue was coated; the tonsils were moderately hypertrophied. The neck was normal. The chest was poorly formed; the ribs were very prominent. The heart and lungs were normal. The abdomen was of the scaphoid type, the liver and spleen not palpable. The arms were spastic. The patellar jerks were hyperactive, and there was a suggestive Kernig's sign.

A ventricular puncture was made and 10 c.c. of fluid withdrawn under greatly increased pressure. Examination of the fluid proved negative. One c.c. of phenolsulphonephthalein was injected into the ventricle, appearing in the spinal fluid in twenty-five minutes. The blood Wassermann reaction was negative. The child was discharged two weeks after admission with the condition unimproved.

Subsequent History.—One year later the child was again admitted with symptoms of vomiting, convulsions, frequent sudden cries, and marked athetoid movements. The mother stated that during the interval of a year there was no marked change in the child's condition. During the last few days, however, she had noticed that the child cried out suddenly at intervals, vomiting frequently, had numerous convulsions, and was constantly in a series of jerky, irregular, incoordinated movements. Physical examination at this time revealed a greatly enlarged head, marked muscle atrophy and well marked spasticity. Nothing in the way of treatment was attempted at this time, as the parents removed the child within two days after admission.

The third admission was three months later. There was no change in the condition. The parents agreed to allow the child to remain under observation, and to allow us to institute any treatment we deemed advisable. The blood Wassermann, urine and blood examinations were negative at this time. The head measured 36 inches (91.5 cm.) in circumference. One month after admission the blood showed a hemoglobin of 65 per cent., 6,200,000 red cells, and 16,000 leukocytes, with a lymphocytosis and 6.5 per cent. of neutrophilic myelocytes. Urine examination was negative. The fundi showed partial optic atrophy with slight cupping of both disks. Examination of the spinal fluid on several occasions proved negative.

Frazier's test was performed at this time. One c.c. of phenolsulphonephthalein was injected into the lateral ventricle. Frazier says: "Under normal conditions, when the dye is injected into the lateral ventricle, it should appear in the fluid withdrawn by lumbar puncture within three to eight minutes. If, therefore, the fluid from the spinal canal, after injection, is not stained within the specified time, it may be

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* From the Medical Service of the Children's Hospital.

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2. Dandy, W. E.: The Diagnosis and Treatment of Hydrocephalus Resulting From Strictures of the Aqueduct of Sylvius, Surg., Gynec. & Obst. **31**: 340-358 (Oct.) 1920; The Diagnosis and Treatment of Hydrocephalus Due to Occlusions of the Foramina of Magendie and Luschka, ibid. **32**: 112-124 (Feb.) 1921.
3. Blackfan, K. D.: The Early Recognition of Hydrocephalus in Meningitis, in Osler, William: Contributions to Medical and Biological Research, **1**: 327, 1919.
4. Elsberg, C. A.: Chronic Internal Hydrocephalus: The Newer Methods for Its Recognition and Treatment, M. Rec. **92**: 874, 1917; Arch. Pediat. **34**: 851-860, 1917.
5. Dana, C. L.: Textbook of Nervous Diseases, New York, William Wood & Co., 1920, pp. 394-396.
6. Oppenheim: Textbook of Nervous Diseases, translated by Bruce, New York, G. E. Stechert & Co. **2**: 953-960, 1911.
7. Hydrocephalus: Manual of Neurosurgery, Medical Dept. U. S. Army, pp. 422-423.

assumed that the drainage of the ventricles has been interrupted, and that we are dealing with hydrocephalus obstructivus. Furthermore, it has been proved conclusively, first that the quantity of cerebrospinal fluid absorbed within the ventricles, if any, is negligible; and secondly that from 30 to 60 per cent. of phenolsulphonephthalein should, under normal conditions, be secreted by the urine within the first two hours. If, therefore, 1 c.c. is injected into the ventricle and the amount secreted by the first two-hour urine specimen estimated, we have at once additional evidence that we are dealing with the obstructive type." Five minutes after the injection, a spinal puncture was done. There was no appearance of the dye; a clear fluid was obtained. Evidently the obstruction here was in the region of the aqueduct of Sylvius, and the fluid was secreted in the fourth ventricle. Moreover, the fact that a subsequent ventricular puncture revealed the dye one week after injection lends further evidence in support of this conclusion. The presence of the dye at this time proved that we were also dealing with the nonabsorptive type. The first specimen of urine, 42 c.c., gave a colorimetric reading of 1.25. The second specimen, 15 c.c., revealed a similar reading.

Regarding treatment, Dana[5] states that the results of surgical interference have so far been unsatisfactory. He mentions puncture of the ventricle or corpus callosum or a decompressive operation as therapeutic resorts. Dandy[2] says that in chronic hydrocephalus there is little hope of spontaneous cure, and that there is no hope from medicinal therapy; that the only hope lies in surgically correcting the cause of the disease, which is almost always an obstruction in the cerebrospinal spaces. He further states that surgical attempts to drain the fluid from the third ventricle to the exterior of the brain have all proved futile. He recommends the construction of a new aqueduct of Sylvius, leaving a tube in place for two or three weeks in the hope that the epithelium will regenerate and form a new canal. He performed this operation successfully on several occasions. The various authorities seem to differ greatly on the question of therapy.

Operation and Result.—Our patient was transferred to the surgical service for further observation. It was finally decided that the only hope lay in operative procedure. The operation was performed by Dr. Harry Kerr assisted by one of us (H. R. L.). Under ether anesthesia a suboccipital decompression was done through a posterior median incision. The pia arachnoid binding the cerebellum and medulla was carefully cut on each side of the median line, and an opening made. The cerebellum and the roof of the fourth ventricle were raised, and the floor exposed. The iter was explored and found to be patent. Neighboring adhesions were broken up and an artificial opening was attempted. The lobes of the cerebellum showed evidences of pressure, and the ventricle contained a large amount of fluid. The membranes were extremely friable, and after several attempts at closure by sutures, the adjacent soft tissues were used to form the roof of the ventricle.

After the operation the child did poorly. He became stuporous, vomited frequently, had numerous convulsive seizures, and died within three weeks.

The second case is of interest not only because of the etiologic and therapeutic factors involved, but also from the varied clinical features presented. It fits well into the new classification of Frazier under the heading of hydrocephalus nonabsorptus. He states that whether the restricted absorption is to be attributed to (1) the cutting off of part of the subarachnoid space by adhesions, (2) a toxic substance in the fluid which prevents its absorption by venous channels, or (3) whether it is due to an abnormal condition of the agents which transport the fluid to the venous circulation, is still a matter of conjecture. He mentions, further, that an obstruction to the venous circulation might be responsible for the delayed absorption, and that a change in the character of the fluid itself or an abnormal condition of the conveyors of the fluid to the venous circulation has etiologic significance. From the latter statement it seems logical to assume that, as the spinal Wassermann reaction in our case was three plus, the pathologic changes in the fluid may have caused a secondary inflammatory reaction in the subarachnoid space, preventing absorption and causing consequent accumulation. The comparative nonprevalence of this reaction in adults we believe to be due to a lessened degree of sensitiveness of the spinal fluid to bacteriologic invasion and reaction; that minute gummas are formed in the walls of the blood channels in these specific cases, and that although the lumen of the vessel is narrowed, absorption is not greatly interfered with.

Case 2.—*History.*—A white boy, aged 9 months, admitted, Sept. 11, 1921, was the first born of apparently physically weak parents; he was born at full term, and weighed 7½ pounds (3.4 kg.). At 6 weeks the child had an acute, purulent otitis media (right) which discharged for a period of five weeks. The child's appetite had been good, but for the last few weeks the mother stated that the child had been restless and that the bowels were irregular. He had been breast fed for three months, followed by feeding of whole milk dilutions and Mellin's food. The complaint on admission was increasing size of the head, with occasional vomiting. The mother thought that the child did not recognize any one.

Physical Examination.—The child was poorly developed, ill nourished, moderately ill, very restless and sweating considerably about the head, which measured 18¼ inches (27 cm.). The abdomen was distended, and there was a double Kernig's sign. The examination was otherwise negative. The Wassermann test of the blood was three plus. A Wassermann examination of the father was reported negative. Ophthalmoscopic examination revealed a bilateral choked disk

One c.c. of neutral phenolsulphonephthalein was injected into the left lateral ventricle. Lumbar puncture, performed six minutes later, failed to reveal the presence of the dye, and in fifteen minutes there was no evidence of it. The urine showed the presence of the dye in twenty-two minutes. A two-hour collection gave an output of 15 per cent.

Clinical Course.—The child was placed on antisyphilitic treatment, and one week later the mother insisted on taking the child home. The following week the child was readmitted in an extremely bad condition. In spite of rigid stimulative treatment the child died within twenty-four hours of admission. Necropsy revealed hypostatic congestion of the lungs; an enlarged, acutely congested liver; a moderately enlarged, congested spleen; pale kidneys having the appearance of granular degeneration, a dilated stomach, and an acutely congested brain. The pia arachnoid was also markedly congested.

Comment.—Regarding therapy in this case, conditions were such that it was impossible to determine definitely the most suitable course. The mother objected strongly to any operative procedures, and as the child was under observation for only a short time we were unable to note any effects from antisyphilitic treatment. The production of a drainage tract into the pleural cavity, an operation suggested in this type of hydrocephalus, was not attempted because of the prevailing conditions.

During the period in which the foregoing cases were under observation, a third patient was admitted with a condition which, on investigation, proved to be of the type known as hydrocephalus hypersecretivus. A review of the records of the cases of "internal hydrocephalus" which were under observation in this institution in recent years failed to show any improvement under medical treatment, and in no instance was any operative procedure attempted. Many of the patients were discharged as "unimproved," while a certain proportion died of intercurrent disease. It would seem apparent, therefore, that until recently, following the work of Dandy, Blackfan, Frazier and others, the question of therapy in these cases was a problematic issue, and that little was to be hoped for in this respect.

Concerning the etiology of this type, Frazier states that since it has been proved that the cerebrospinal fluid is the secretory product of the choroid gland, it

would seem logical to suppose that a pathologic condition of the gland itself or a toxic substance in the fluid coming in contact with the plexus might bring about a hyperactivity of the cells.

CASE 3.—*History.*—A colored girl baby, aged 4 months, admitted, Sept. 25, 1921, had had progressive enlargement of the head since birth. The mother stated that the child took its feedings poorly, did not seem well, was very restless, and did not appear to thrive.

Physical Examination.—The child was moderately ill, with a greatly enlarged head which measured 23 inches (58 cm.) in circumference. The weight was 20 pounds (9 kg.). Blood and urine examination were negative. The day following admission the left lateral ventricle was entered and a small amount of fluid withdrawn. One c.c. of the neutral solution of phenolsulphonephthalein was injected and a spinal puncture performed six minutes later, the dye making its appearance at this time. The appearance time in the urine and the two-hour output were normal. Blood and spinal Wassermann tests were negative. Ophthalmoscopic examination revealed a pale right disk with the edges well marked and a ring of pigment around the temporal side. The left disk was markedly cupped, pale, with a ring of pigmentation. There was no capillary circulation.

Treatment and Course.—The general appearance and behavior of the child led us to believe that there might be some endocrine disturbance as the etiologic basis, secondarily affecting the secretory mechanism regulating the cerebrospinal fluid. With this in mind, the child was placed on thyroid extract, one-eighth grain (8 mg.) three times daily. After a week's treatment there was a marked improvement noted. The child seemed brighter, took its food well, and appeared stronger physically. The head measurement showed no increase at this time. The dosage was increased to one-fourth grain (16 mg.) three times daily on the tenth day.

Comment.—Relative to the significance of endocrine disturbances, we note that Timme [8] and Goetsch have brought forth some noteworthy data on this subject. Timme states that if the activity of the thyroid gland is impaired, the proteins are not split up for release from the body, the cells are clogged up by the amino-acids, oxidation becomes lower, and the entire body economy slows down. The resultant syndrome is a slow pulse, a lowered blood pressure, diminished cerebral activity, and a gain in weight. The excessive weight, poor muscle and tissue tonicity, loss of appetite and languid aspect which the child showed might easily be accounted for by the metabolic derangement resulting from a lowered activity of the thyroid gland. The action of the thyroid extract in this instance, causing a decomposition of the amino-acids, served to increase oxidation and consequently to stimulate the metabolic activities. Regarding its effect on the spinal fluid, Frazier noted in his experiments that it reduced the secretion by acting as a depressor on the choroid plexus.

Further History.—The child remained under treatment and observation for a period of three weeks, during which time there was a weight loss of 2½ pounds (1.13 kg.) and a marked improvement in the general condition. Unfortunately, we could not continue our observations, the mother insisting on removing the child after noting the improved condition.

In presenting these cases we have outlined our observations as carefully as possible, and hope that we have at least added something toward stimulating further interest in this subject, especially regarding the clinical and therapeutic aspects. Treatment in these cases is still in the experimental stage, and, although the methods advocated do not always lead to successful results, the improvement noted in many instances merits further attention and investigation by those who are called on to treat these cases.

CONCLUSIONS

1. Surgical procedures offer the best chances for successful treatment of the obstructive type, in the vast majority of cases.

2. The determination of a definite etiologic basis and the employment of all available methods to determine the type of internal hydrocephalus are essential for accuracy in the character of treatment instituted.

3. The hypersecretive and nonabsorptive types respond to medical treatment in direct proportion to the character of the underlying etiology and pathology.

4. The rôle of the endocrines in its clinical and therapeutic relationship to the hypersecretive type, while as yet indefinite, looms forth as a significant factor.

8. Timme, Walter: A Survey of Endocrinology, New York M. J. 113: 374-378 (March) 1921.

SPINAL AND SPINOBULBAR TETRAPLEGIA OF ACUTE AND SUBACUTE ONSET

ITS CAUSES AND PROGNOSIS *

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Paralysis of all four limbs might be termed quadriplegia or tetraplegia; since the Greek prefixes hemi, mono and tri are used, it seems that tetraplegia would be the more acceptable term although it is not so commonly used as quadriplegia. In addition, tetraplegia is a pure word, whereas quadriplegia is one of both Latin and Greek origin. Crural paraplegia of acute or subacute onset is a common disease, and paraplegia due to pressure such as arises from tumors of the spinal cord or from disease of the vertebra is only too frequently seen. Paralysis of all four limbs due to any cause is uncommon, if the paucity of the remarks seen on the subject in textbooks and the literature may be considered as proof.

Paralysis of all four extremities due to lesions of the upper cervical cord or lower part of the bulb may be due to: (1) occlusion of the anterior spinal artery; (2) hematomyelia; (3) cervical myelitis; (4) pressure on the spinal cord such as is exerted by a spinal tumor, Pott's disease, hypertrophic pachymeningitis and rarely by a hemorrhage outside the cord substance; (5) direct injury to the spinal cord, or (6) chronic degenerative diseases of the spinal cord, such as amyotrophic lateral sclerosis, and syringomyelia.

It is not my intention in this presentation to consider tetraplegia of chronic development or that due to direct injury of the spinal cord.

In 1903, Mills and Spiller reported a case of paralysis of all four limbs and one side of the face, with dissociation of sensation which developed in the course of a few hours and was due to a meningomyeloencephalitis. In their case at postmortem was found intense round-cell infiltration of the pia covering the medulla, and here and there throughout the medulla there were small vessels with round-cell infiltration about them. The right seventh nerve nucleus was exceedingly degenerated. The fourth, fifth and sixth cervical segments were so diseased that the normal relations of the white to the gray matter were entirely altered. Some of the small vessels within the spinal cord and pia at this level had changes in their coats, and there were numerous small hemorrhages within the spinal cord.

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* From the Philadelphia General Hospital and the University of Pennsylvania School of Medicine.

*Owing to lack of space, this article is abbreviated in THE JOURNAL by the omission of several case reports. The complete article appears in the author's reprints.

Lloyd has reported a case in which there was literally paralysis below the eyes. In this case, following a period in which there was subjective difficulty in speech and in walking, the patient quickly lost power in all four extremities, the lower part of the face, the tongue and the pharynx. His mind was clear, and he could move the eyes and wrinkle the forehead. Death ensued in two weeks. The lower part of the pons on its anterior aspect was the seat of extensive softening, and the basilar artery was thickened. The bulb was normal, but the cervical cord showed a cavity in the posterior columns.

In 1908, Spiller wrote about the symptomatology which one would expect to find from the occlusion of the anterior spinal artery at the upper limits of the spinal cord or the lower limits of the bulb. The syndrome was paralysis of all four extremities, the trunk and the neck, whereas the functions necessary to life would be preserved. This paralysis would be due to an involvement of the pyramids. Because of the anatomic fact that the lemniscus is immediately behind the pyramids, there would probably be a disturbance of the sense of position and vibration. The tongue might be involved. The syndrome might also be unilateral if only one anterior spinal artery was affected. Spiller reported, in his communication, a case of tetraplegia the result of disease of the anterior spinal artery.

At this point it might be worth while briefly to review the arterial supply of the upper part of the bulb and spinal cord. The anterior spinal arteries are branches of the vertebrals, and they unite to form the anterior median artery which runs down the entire length of the spinal cord, receiving reinforcement for the lateral arteries. According to Dana, the anterior spinal artery thus nourishes only a few upper segments of the spinal cord, the supply of the remainder of the cord being derived from the lateral arteries. The anterior median artery is not, as is generally supposed, a true prolongation of the anterior spinals, but is made up chiefly by the lateral spinals. Occasionally there is only one anterior spinal artery, and this usually arises, according to Duret, from the left vertebral. For a tetraplegia to result from a lesion of one anterior spinal artery, it would be necessary that there be only one, or that the anterior median artery be diseased shortly after it is formed by the union of the anterior spinals. The arterial supply of the posterior part of the spinal cord is formed by the posterior spinal arteries, which unite on the posterior surfaces of the spinal cord and supply chiefly the white matter, whereas the anterior median artery supplies the gray. From the posterior spinals are derived the plexuses on the posterolateral surfaces of the spinal cord.

In 1909, Spiller reported a case in which there was thrombosis of the cervical anterior median spinal artery. In this case, following the lifting of heavy blocks of ice, the patient became paralyzed in both upper extremities, and there was weakness in the lower extremities. There was also some disturbance of sensation, chiefly of pain and temperature, over the whole of the trunk and both forearms as high as the elbows. There was no disturbance of the sense of position. This man lived three years, and at necropsy the spinal cord showed a softening which began at the fourth cervical segment and involved the spinal cord as low as the second thoracic segment. The softening was due to a thrombosis of the anterior median spinal artery.

As examples of paralysis of all four extremities due to thrombosis of the anterior spinal artery, three cases are reported:

CASE 1.—*History.*—M. C., a white man, aged 59, admitted, Oct. 6, 1919, to the Philadelphia General Hospital to the service of Dr. William G. Spiller, complained chiefly of weakness of the knees. Three years before, the patient had been perfectly well. He had been lifting heavy timbers, and after a day of hard work he went to bed much fatigued. The following morning he could not get out of bed, and said that he was "paralyzed from the neck down." He was not unconscious, and had no trouble chewing or swallowing, and his face was not drawn to either side. The bowels and bladder were not affected. The tetraplegia lasted for two weeks and then improved gradually. The first return of power was in the right arm; then power returned in the left arm, and in about two months from the onset he was able to walk with the help of a cane. The man, who was intelligent, said that at no time did he lose the ability to recognize touch, pain and heat and cold.

Physical Examination.—The patient was fairly well developed, and presented no evidence of disease of the lungs, heart, kidneys, pupils or cranial nerves, although there was fairly well marked arteriosclerosis. The gait was markedly spastic, and the man tired quickly. All of the deep reflexes were exaggerated, and Babinski's sign was present on both sides. There was no ankle or wrist clonus. The muscular power in both upper extremities was fairly good; that in the lower extremities was weak. There were no atrophies or fibrillary tremors. Pain, touch and heat and cold were normal throughout the entire body. The sense of position was markedly impaired in the toes, and astereognosis was present in both hands; unfortunately, no note was made concerning the sense of position in the upper extremities. The man had peculiar paresthetic phenomena in his hands and feet; he said that his feet and ankles burned as though they were in an oven, whereas his hands were always cold. He continually wore a woolen glove on the left hand because of the sensation of coldness in that part. The urine showed no abnormalities, and the blood Wassermann reaction was positive in all antigens. A lumbar puncture was not permitted. He improved after a seven months' stay in the hospital, and left.

This man represents a case of occlusion of the anterior spinal artery at about the junction of the bulb and the spinal cord, thus involving the pyramids and the lemniscus, which lies immediately behind.

CASE 2.—*History.*—W. R., a white man, aged 38, was admitted, June 19, 1915, to the Philadelphia General Hospital to the service of Dr. W. G. Spiller. Thirteen months before the onset of his trouble his left arm felt stiff and numb, although this disability never prevented him from doing his work. In November, 1914, he was supposed to have pneumonia, but this is not certain. During that illness, which lasted six days and in which he was unconscious, he became totally paralyzed in both arms and legs, and could not move his head from side to side. He said that he could chew, swallow, talk and move his eyes; he did not lose control of the bladder, but was markedly constipated from the onset. The first return of power was the ability to move the head. After that the power gradually returned, so that by Feb. 23, 1917, he was able to walk a short distance without assistance. The right upper extremity and the left lower extremity have regained more power than their fellows. It is interesting to note that during part of this time, the patient was taking 1,000 grains (65 gm.) of potassium iodid daily, this having been prescribed by an optimistic therapeutist.

Physical Examination.—The patient was well developed and well nourished. The pupils, cranial nerves, lungs, heart and kidneys were normal. Romberg's sign was present, and the gait was markedly spastic, with an element of ataxia. All of the deep reflexes were exaggerated, with a bilateral ankle clonus and Babinski. The abdominal reflexes were normal. Marked atrophy was present in the muscles of the left shoulder girdle, and to a less degree in the deltoid and pectorals.

There was marked weakness in all movements of the left upper extremity and of both lower extremities, more marked in the right lower than the left. Power in the right upper extremity was fairly good. Complete astereognosis was present in both hands, and there was a great impairment of the sense of position in both hands, more marked in the left. Despite the fact that the patient had good power in the right hand, he had the greatest difficulty in dressing and undressing. The sense of position was lost in the toes of both feet. The sense of vibration was lost as high as the sixth rib, but was well appreciated above that point. Pain, heat and cold and touch were well appreciated throughout. This man also showed peculiar paresthetic phenomena in that his legs always felt cold. He also had dysesthesia in the right hand, as evidenced by the fact that a bowl of tea, not hot enough to burn his mouth, could not be picked up without producing severe discomfort in the right upper extremity. The spinal fluid of this man was negative, although the blood Wassermann reaction was strongly positive.

While he is still partially disabled, he has recovered sufficiently to be placed on the pay roll at the Philadelphia General Hospital.

This case is an example of the same condition described above, although in this patient the area of involvement went lower into the spinal cord because there was atrophy of the muscles of the left shoulder girdle. The case perhaps illustrates the rare occurrence of an involvement of the pyramids as they are decussating. In this man, although all four extremities were equally paralyzed at the onset and for months afterward, at present the right upper and the left lower extremities show by far the greatest improvement.

The third case is one of cervical myelitis probably due to occlusion of the anterior spinal artery or anterior median spinal artery. In this case the symptoms presented on examination indicated a lesion lower than in the two cases reported above.

CASE 3.—*History.*—J. B., a white man, aged 62, was admitted to the Philadelphia General Hospital, Aug. 18, 1913, being assigned to the medical department, and was later transferred to the service of Dr. C. K. Mills. According to the man's story, he went to work one day in February, 1898, feeling in his usual good health. While working, he became suddenly unconscious and did not regain consciousness for several days, when he noticed that he could not move any part of the body below his head. In seven months he recovered enough so that he was discharged from the hospital. After this illness he noticed that his hands and arms wasted. At no time had he had any pain except for a few weeks three and one-half years before admission, when he had pain and stiffness in his neck, and the stiffness became permanent. The patient had a chancre at the age of 16 years.

Physical Examination (Oct. 21, 1914).—The patient was intelligent, and could relate his history in a clear and logical manner and without contradiction. The pupils were unequal, the right being larger, and the reaction to light was very sluggish. Romberg's sign was present, and the gait was slightly ataxic. The movements of the head were restricted in all directions, and there was slight tenderness over the upper cervical vertebrae. The forearms and hands showed marked wasting, the left more than the right, the left being a claw hand. The thighs were atrophied, the left somewhat more than the right. The right biceps reflex was present and about normal; the left biceps reflex was very much diminished. Both triceps reflexes were present and normal. Both patellar and Achilles reflexes were lost. The abdominal reflexes were present and normal, but plantar stimulation produced no response on either side. Sensation was normal except for a small area which involved the supraclavicular fossa and the deltoid region on the right, in which pain sense was not appreciated. The peripheral arteries were sclerosed, and examination of the heart disclosed that the apex was in the sixth interspace in the anterior axillary line and that the signs of aortic regurgitation were present. Blood and spinal fluid examinations were not made. The patient remained in the Philadelphia General Hospital until March 21, 1915, when he died of an acute cellulitis of the right leg. Dr. Lucke and I performed a necropsy; unfortunately, I have been unable to obtain the pathologic report.

This case appears to be one of occlusion of the anterior median spinal artery affecting chiefly the lower cervical cord. The anterior horn cells were involved, as shown by the atrophy of the forearms and the hands. The anterior horn cells in the lower part of the cord were also involved, but this may have been a process that occurred after the original thrombosis. The absence of pyramidal tract symptoms and the preservation of sensation are due to the fact that the anterior median spinal artery does not supply the posterior columns or the pyramidal tracts.

Injuries to the back, such as result from blows or falls, may produce a hemorrhage into the substance of the spinal cord. This occurs into the gray matter and very rarely into the white. The reason that hemorrhages occur into the gray matter is that the pressure in the arteries is high and the venous outlet is poor (Kadyi). Occasionally, hematomyelia occurs in the course of acute infections. Subdural or epidural hemorrhage is very uncommon. If hematomyelia occurs in the upper cervical spinal cord, there may be paralysis of all four extremities.

Cervical myelitis originating in the course of acute infections or occurring secondary to the disease of the blood vessels produced by syphilis may cause tetraplegia.

Instances of acute or subacute paralysis of all four extremities resulting from pressure on the spinal cord, unless it be due to trauma, are uncommon. In 1879, Mills reported a case in which the patient suddenly lost power in both arms, followed the next day by paralysis of both legs. At the necropsy a large clot of blood was found outside the dura and extending on the left side from the fifth cervical segment to the upper limit of the spinal cord. The dura was the seat of a number of irregular growths which proved to be gummas, and the upper segments of the spinal cord were the seat of a transverse myelitis. In this case there occurred that rare happening of a spontaneous extradural hemorrhage, which was probably due to an interference with the circulation produced by the new growths. I have seen one case in which paralysis of one arm and both legs came on suddenly, followed in a short time by paralysis of the other arm, the condition being due to Pott's disease.

The cases presented are not only of interest from the etiologic point of view and from the location of the lesions, but also of importance because of the recovery which most of them showed. Nothing more serious could happen to a person, perhaps, than a paralysis of all four extremities coming on either acutely or subacutely. That such a condition is not always hopeless and that marked improvement may result in patients suffering from tetraplegia is attested by most of the cases which I have presented. It is needless to say that those with the most favorable prognosis are those of syphilitic origin in which the treatment is pushed. The two patients with hematomyelia also improved remarkably, one of them making a complete recovery and the second patient regaining more power as time goes on. The woman (Case 6) who developed tetraplegia during the course of epidemic encephalitis and who was bedfast for months made a complete recovery.

1909 Chestnut Street.

EPIDEMIC (LETHARGIC) ENCEPHALITIS

RECURRENCE OF SYMPTOMS ONE AND ONE-HALF YEARS AFTER APPARENT RECOVERY *

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With the passing of the epidemic of encephalitis, interest in this disease has also waned. It is only after a considerable interval of time, however, that we can fully estimate the permanent damage done by the infection; the chronicity of the disease and the question of relapse and reinfection.

Any one who has had a considerable experience with encephalitis will recall instances in which patients have relapsed, usually after an interval of days or weeks rather than months. One case has been reported with a recrudescence after one year (Blakesley), and recurrences have been seen during grip epidemics (Mayer). In my own experience, fatigue has been a potent factor in producing relapse, a long automobile ride immediately preceding a marked recrudescence in two instances.

The case herewith reported is placed on record because of the long interval (more than one and one-half years) between the disappearance of all symptoms and their recurrence. It is the longest interval or remission so far recorded, to my knowledge.

REPORT OF CASE

M. C., a girl, aged 12 years, seen in consultation with Dr. J. A. True, Nov. 3, 1921, had had fever, vomiting, diplopia and paresis of the extremities, in February, 1920, during the height of the encephalitis epidemic. She was confined to bed for a week, and in six weeks had apparently made a complete recovery, returning to school. No abnormality was noticed until Oct. 16, 1921 (one year and nine months from the initial infection and more than one and one-half years after apparent recovery), when she developed slight headache, nausea, vomiting, fever, diplopia, anesthesia in the distribution of the right fifth nerve, and paresis of the right arm and leg with the Babinski sign. She slept practically all of the time for two days and nights. The condition then gradually cleared up and she went out, October 31. On the following day she developed numbness of the left side, with dizziness.

When seen, November 3, there was no fever; the child complained of slight headache and nausea, and had vomited. She was mentally clear but unresponsive, indifferent, rarely speaking and then only in monosyllables. The pupils were widely dilated and almost inactive to light. In convergence, the right eye would not turn in. There was incomplete ptosis of the left upper lid. Dr. Raymond Sprowl reported the eyegrounds normal. There was hypesthesia of the right face, marked paresis of the left arm, and moderate paresis of the left leg. The patella tendon reflex was increased on both sides; the Babinski reflex was present on the left, and a normal plantar response on the right. The abdominal reflexes were lost. The face was expressionless; there was no twitching nor choreiform movements, no bulbar symptoms nor hiccup. The heart and lung sounds were normal. The blood pressure was: systolic, 110; diastolic, 85. The cerebrospinal fluid was negative as to the Wasserman test, cells and increased globulin.

November 5, the child developed bulbar symptoms and a rapid rise of temperature, and died of respiratory paralysis.

COMMENT

The question could be raised as to whether this child did not have a reinfection. While admitting this as a possibility, the known tendency of epidemic encephalitis to relapse, and the absence of any data regarding reinfection in the disease, point toward a flaring up of encapsulated infectious foci, rather than a reinfection from an outside source.

It is interesting to compare encephalitis, from the standpoint of relapse and reinfection, with poliomyelitis, the disease with which it has so much in common. Taylor, in 1916, reported a case in which there were two attacks of poliomyelitis three years apart, and reviewed the literature on the subject. His conclusion was that, while an attack of poliomyelitis in the great majority of cases confers a lasting immunity, it is definitely established that exacerbations or relapses may occur at short intervals of time after the primary onset and, finally, that the evidence is accumulating to show that an actual second attack with reinfection from an external source may, and probably does occur in rare instances. What Taylor wrote of poliomyelitis may be true of encephalitis.

The possibility of a relapse in epidemic encephalitis after an interval of a year or longer is of interest to life insurance statisticians, who already are somewhat chary of renewing health policies to persons who have had encephalitis.

Paulsen Building.

* Read before the Spokane County Medical Society, Spokane, Wash., Jan. 26, 1922.

ACTIVE IMMUNIZATION WITH DIPHTHERIA TOXIN-ANTITOXIN

OBSERVATIONS OF THE SCHICK TEST: DURATION OF IMMUNITY CONFERRED BY IMMUNIZATION WITH DIPHTHERIA TOXIN-ANTITOXIN, AND INCIDENCE OF DIPHTHERIA FOLLOWING ITS ADOPTION

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The value and efficacy of active immunization with diphtheria toxin-antitoxin mixture depends, first, on the degree and the duration of the immunity conferred, and, secondly, on the extent to which such immunization reduces the incidence of diphtheria.

The Schick test offers the means of determining the degree of immunity. According to Park,[1] any child over 2 years of age showing a negative Schick, when the test is properly made, is immune to diphtheria, probably for life.

Schroeder,[2] reporting on the duration of immunity conferred by injections of diphtheria toxin-antitoxin mixture, found that of twenty-eight children with a positive Schick test, twenty-two became negative within four months and remained so for five years. Of 570 schoolchildren retested in the last two years from 90 to 95 per cent. were found to be immune.

Zingher [3] and his co-workers have applied the Schick test to 52,000 children in the schools of New York City. Those who gave a positive reaction were given injections with toxin-antitoxin mixture. In one school, of 160 retested five months after injection, 87.5 per cent. gave a negative Schick reaction.

THE PRESENT WORK

Immunization with diphtheria toxin-antitoxin was started at the Marks Nathan Orphan Home in May,

1. Park, W. H.: Does a Negative Schick Test Indicate Present and Future Security from Diphtheria? Arch. Pediat. **38**: 329 (June) 1921.
2. Schroeder, M. C.: The Duration of the Immunity Conferred by the Use of Diphtheria Toxin-Antitoxin, Arch. Pediat. **38**: 368 (June) 1921.
3. Zingher, Abraham: Diphtheria-Prevention Work in the Public Schools of New York City, J. A. M. A. **77**: 835 (Sept. 10) 1921.

1918, by the Department of Health of the City of Chicago. One cubic centimeter of toxin-antitoxin mixture was injected at weekly intervals until three injections had been received. Preliminary Schick tests, as well as tests shortly following immunization, were made, but, unfortunately, these records were not kept.[4] Since 1918, toxin-antitoxin injections have been given to all newly admitted children. Every child, therefore, with the exception of twenty-four who were recently admitted, has received three injections of diphtheria toxin-antitoxin. The first part of this report deals with the results of Schick tests which I made in January, 1922. The toxin and control used in the Schick test were prepared by the Chicago health department. Two-tenths cubic centimeter of toxin and the same quantity of control were injected intradermally just below the elbow of each arm, as recommended by Zingher. Results were observed twenty-four hours, forty-eight hours and four days after injection. The reaction noted on the fourth day was taken as the final result. A number of results were doubtful. Negative pseudoreactions were also observed, but these are not recorded.

RESULTS OF SCHICK TEST

A total of 284 children varying in age from 5 to 16 were given the Schick test. Of these, 260 had been injected with diphtheria toxin-antitoxin.

Of 108 children, 102, or 94.4 per cent., showed a negative Schick test forty-four months after injections, which were made in May, 1918. A positive Schick test was obtained in three, or 2.7 per cent., and in three or 2.7 per cent., the reaction was doubtful.

Of sixty-seven children, fifty-six, or 83.5 per cent., were negative twenty months after diphtheria toxin-antitoxin injections, which were made in May, 1920. A positive Schick test was obtained on eight, or 11.9 per cent., and in three the reaction was doubtful.

Of forty children, thirty-nine, or 97.5 per cent., were negative sixteen months after injections, which were made in September, 1920. A doubtful Schick test was obtained in one case.

Of forty-six children, forty-five, or 97.5 per cent. were negative five months after injections, which were made in August, 1921, and in the remaining case the Schick test was doubtful.

Of the twenty-four children recently admitted to the home who did not receive injections of diphtheria toxin-antitoxin, six, or 25 per cent., were Schick positive, and seventeen, or 70.8 per cent., were negative. One case was doubtful.

These results are a striking confirmation of those obtained by the investigations in New York. The higher percentage of positive Schick results in the children not injected is also very clear.

THE INCIDENCE OF DIPHTHERIA SINCE IMMUNIZATION WITH TOXIN-ANTITOXIN MIXTURE

In 1921, twenty patients in all were admitted to the small hospital of the home complaining of "sore throat." These cases presented the same clinical features, which were elevation of temperature as high as 102; redness and swelling of the tonsils, the occurrence of an exudate on the tonsils, and a varying degree of toxemia. Routine cultures of the throat were made, and the specimens were examined by the health department. In six of these cases the bacteriologic report was positive for diphtheria bacilli. In each of these cases, injections with toxin-antitoxin mixture had been given, the longest interval since injection being forty-four months in one instance, and the shortest interval five months. No Schick tests were made at the time of the infection, but in January, 1922, all these patients were Schick negative. Because of the limited facilities in the hospital of the home, two of these patients were sent to the Durand Contagious Hospital, two to the municipal contagious hospital, and two were isolated in the private rooms of the home. The two patients remaining at the home presented no clinical evidence of diphtheria. Antitoxin was not administered, and in a period of four days they were afebrile. They were discharged after two negative cultures. Of the two patients admitted to the Durand Hospital, both were discharged with the diagnosis of tonsillitis. No antitoxin was administered in either case. The two patients sent to the municipal contagious hospital were treated with diphtheria antitoxin and regarded as having diphtheria.

In a recent communication, Park [5] states that "those who have natural antitoxin and those who acquire it through toxin-antitoxin injections may harbor diphtheria bacilli; and, if they later suffer from tonsillitis due to other microbes, throat cultures will contain diphtheria bacilli. The positive cultures alone suggest, but do not establish, that the suspected case is one of diphtheria." Further, "When diphtheria bacilli are present in the throat, which becomes the seat of other infections, they may develop their toxins and cause superficial lesions in the mucous membrane, even though the cases have sufficient toxin to give a negative Schick. Cases which present this possibility are rare but have done well without injection of antitoxin."

RESULTS OF SCHICK TESTS AFTER INJECTION WITH TOXIN-ANTITOXIN

Time Interval After Injection	Number Tested	Results			
		Positive	Negative		Doubtful
			Number	Per Cent.	
44 months	108	3	102	94.4	3
20 months	67	8	56	83.5	3
16 months	40	0	39	97.5	1
5 months	46	0	45	97.5	1

In view of these observations, it is safe to assume that at least four of these cases were not diphtheria. In the two instances in which antitoxin was administered, we must perforce assume that they were diphtheria. These two instances, which may justly be questioned, comprise the total number of cases of diphtheria in the Marks Nathan Orphan Home for the entire year of 1921. Prior to this, diphtheria had been a constant problem. In 1917, prior to the introduction of toxin-antitoxin in the home, there were ten cases. In 1918, the year in which diphtheria toxin-antitoxin was first introduced, there were two cases, and in both instances these children had not received toxin-antitoxin.

In 1919, in which year there was a total of three cases, one case occurred in a boy injected in May, 1918, with toxin-antitoxin mixture. In 1920, a total of fifteen cases was recorded as diphtheria. Of these patients, only four had received immunizing doses of diphtheria toxin-antitoxin, while the remaining eleven had not received injections. In the four cases in which

4. The superintendent of the home informs me that he recalls that of the 250 children on whom the Schick test was made in 1918, prior to toxin-antitoxin injection, 237 were positive and thirteen negative.

5. Park, W. H.: The Degree of Immunity to Diphtheria Insured by a Negative Schick Test, Am. J. Dis. Child. **22**: 1 (July) 1921.

injection had been given, diphtheria was diagnosed in one, one month after injection, in another eight months after injection, and, in the two remaining, twenty-four months after injection. It is not possible for me to record any clinical data with reference to these cases, as no records are available.

SUMMARY

The Schick test is a means of testing the immunity against diphtheria in those who possess a natural immunity and those who acquire an active immunity as a result of injection with diphtheria toxin-antitoxin. The duration of immunity conferred by injection of diphtheria toxin-antitoxin mixture, as determined by the Schick test, extended for a period of forty-four months in 94.4 per cent. of the cases, for twenty months in 83.5 per cent., and for sixteen months and five months in 97.5 per cent.

The incidence of diphtheria has decidedly diminished since injection of diphtheria toxin-antitoxin has been adopted as a routine measure.

25 East Washington Street.

OXYGEN INFLATIONS OF PERITONEAL CAVITY IN TUBERCULOUS EXUDATIVE PERITONITIS

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In the course of my studies of artificial pneumoperitoneum as an aid to roentgen-ray diagnosis, the idea occurred to me that oxygen inflations of the abdominal cavity might be utilized therapeutically for the treatment of tuberculous peritonitis. Clinical observation had shown marked improvement exhibited by several children with peritonitis after the performance of one oxygen inflation prior to roentgen-ray examination. Unfortunately, these cases could not be followed up at the time on account of other urgent demands on my time, but I resolved to try out this therapeutic measure at the first opportunity. This presented itself soon, and the case is worthy of some interest:

REPORT OF CASE

Mrs. T. M., aged 32, was referred to me by Dr. B. Sachs with the complaint of constant pain in the back, and I saw her first, Oct. 26, 1920. The family history was negative. She had had one confinement several years before, and had always had very painful menstruation. Urination was frequent by night as well as by day. The patient had no other complaints, but felt otherwise well and looked the picture of health.

A general examination at that time revealed the heart, lungs and abdomen to be normal. Deep pressure over McBurney's point elicited slight pain. The patient seemed to be in excellent general health; and her weight was 156 pounds.

The vulva and vagina were normal; the cervix pointed toward the symphysis. The body of the uterus was retroflexed. The posterior parametrium exhibited marked tenderness on the effort to push the uterus back into position. The adnexa appeared normal.

The patient was advised to have the uterus replaced in its normal position, and an operation was accordingly performed by me at the end of October. A transverse (Pfannenstiel) incision was made, the uterus was suspended, and the adnexa were freed from their adhesions. The appendix was, of course, also removed. At the time of operation the parietal as well as visceral peritoneum and the omentum were perfectly normal, and there was not the slightest evidence of tuberculosis in either adnexum. The postoperative course was uneventful, and the patient left the hospital about two and a half weeks after operation completely cured.

I did not see the patient again until March, 1921, about three months after her discharge from the hospital. At that time she complained of marked pains, which had appeared very suddenly in the right lower abdomen, and of a sensation of "fulness" in the abdomen, which amounted to acute discomfort after eating. At that time she did not look as well as formerly, but a careful examination of the abdomen permitted no definite diagnosis. To exclude the gallbladder and kidneys, a roentgen-ray examination (without artificial pneumoperitoneum) was undertaken, and normal conditions were reported. The patient therefore received some tonics and was put under observation. Her condition, however, failed to improve, growing progressively worse. The abdominal pains became more severe, and the abdomen increased in size. Night sweats also made their appearance.

One evening in March I was called to the home of the patient. Her temperature was 105; pulse, 120. Extreme distention of the abdomen was accompanied by marked pain. The patient was in a profuse perspiration. Examination revealed the presence of free fluid in the abdomen, and a diagnosis of acute, exudative tuberculous peritonitis with marked accumulation of fluid was made.

On the following day, March 25, the patient was transferred to Lenox Hill Hospital, and on March 28 a roentgenogram was taken following artificial pneumoperitoneum.[1] Dr. Stewart reported: "Roentgenographic examination reveals free fluid in the peritoneal cavity as shown by the change in the fluid level. In the plate taken on the back we have evidence of adhesions and thickening of the peritoneum. Roentgenographically, the case presents evidence of tuberculous peritonitis."

March 29, a roentgenogram of the lungs failed to detect evidence of pulmonary tuberculosis.

Concerning the therapeutic aspect of this method, the oxygen which was injected at the time of the pneumoperitoneal roentgen-ray examination was not withdrawn. Thirty-six hours later there was still some oxygen present. The whole procedure did not cause the patient the slightest discomfort, and the improvement in her general condition after this single inflation was most marked. By April 1, her temperature had dropped to about 100. She was therefore given another therapeutic oxygen inflation of the abdominal cavity on that date. About 4 liters (244 cubic inches) of oxygen was injected, causing no discomfort whatever. The patient even looked forward to the treatment, anticipating the promptly beneficial effects which had followed the first inflation.

March 6 and the next few days another slight rise in temperature was noted, but the night sweats disappeared completely. April 5 and 11, two more inflations were performed, and on the morning following the last one the temperature dropped to practically normal and remained normal.

The patient was discharged from the hospital the next day, and from that time on her condition remained perfectly normal. I saw her several times at my office during April. She had promptly proceeded to take on weight, made no complaints whatever, and presented an extremely healthy appearance. I warned her, however, that she might at any time experience a recurrence of a milder type, and should this happen directed her to report at once to me for further oxygen inflations.

Not long afterward, while visiting relatives in Baltimore, she had another attack and intended to return at once to New York to consult me. She was overruled, however, by her relatives in that city, and Dr. Maurice Lazenby of Baltimore was accordingly called on. Dr. Lazenby wrote me, May 5:

"My diagnosis in Mrs. M's case was papillo-adenocystoma of the ovary with probable malignancy. On April 25 I operated. I made at first a midline incision. My incision extended down to the peritoneum, but when advanced this far I found the peritoneum markedly edematous and thickened and was unable to gain entrance to the abdomen. I made a second incision, a high right rectus, about 2 inches in length

1. The technic of artificial pneumoperitoneum has already been fully described (Stein, Arthur and Stewart, W. H.): Pneumoperitoneal Roentgen-Ray Diagnosis, J. A. M. A. 75:7 [July] 1920; Pneumoperitoneal Roentgen-Ray Diagnosis (A Monograph with Atlas), Troy, N. Y., Southworth Company, 1921.

in hopes that I might be able to accomplish something by this route. I was able to get into the abdomen, in which quite a large quantity of blood-tinged serous fluid with numerous flaxes was found. The omentum was fastened firmly to the anterior abdominal wall. Upon exploring the upper cavity, finger came in contact with a nodule about 2 cm. [three-fourths inch] in diameter in the omentum which was very hard and suggested carcinoma. This was excised. Upon further exploration there were found numerous nodules over the under surface of the liver and as far as the finger could reach on the peritoneum. Attempt was made to gain entrance through the lower incision by finger through the upper incision. There were found, however, numerous loops of gut adherent to the abdominal wall. This was especially true in the region of the sacrum. Patient was then closed. The specimen removed was examined at the time first by frozen section and later confirmed by prepared specimen and found to be tubercular. In this specimen there were numerous caseating tubercles.

"As a guide for you in your prepared work I would suggest that the injections you intend to make be made high in order to avoid these loops of bowel."

According to this letter it is plain that the abdominal cavity was not opened at all at the point of Dr. Lazenby's first incision, and only a small portion of the peritoneum was excised through another very small incision for microscopic examination. This microscopic diagnosis confirmed our original pneumoperitoneal roentgen-ray as well as clinical findings.

The patient has had no further attacks, and at the present time weighs (stripped) 152 pounds (69 kg.), whereas at the time of her illness in March her weight was 124 pounds (56 kg.).

COMMENT

While the effect of air on tuberculous peritonitis is known to all internists as well as surgeons, it having been countless times proved that after laparotomy for tuberculous exudative peritonitis the general condition of the patient improved, it is clear that this new procedure of oxygen inflation offers a tremendous advantage over laparotomy as a therapeutic measure. The pneumoperitoneal method may be employed as often as indicated, ten, twelve or fifteen times, even more if desired, while a laparotomy with its accompanying shock, etc., may at the utmost be resorted to only twice. The patients experience little or no discomfort from the inflations, and after realizing the immediately beneficial effects of the first oxygen administration they usually look forward cheerfully and contentedly to the next treatment.

At present there is at Harlem Hospital, in Dr. Riesenfeld's service, a child, aged 11 years, who was admitted with a markedly distended abdomen filled with free fluid, and a diagnosis of exudative tuberculous peritonitis. So far, ten inflations have been administered with results that are simply amazing.

In passing, it might be mentioned that it is advisable to remove the ascitic fluid. It will be found also that these ascitic patients can tolerate much greater inflation (up to 5 or 6 liters [from 305 to 366 cubic inches] of oxygen) owing to the distention of the abdominal walls by the ascitic fluid. These patients rarely complain of any discomfort throughout the procedure.

No satisfactory explanation for the improvement of tuberculous peritonitis by surgical intervention has been offered, but it may well be that contact of the infected peritoneum with the atmospheric air, i. e., the oxygen contained therein, is the effective factor. In combination with laparotomy, oxygen has been utilized in the treatment of tuberculous peritonitis by McGlinn of Philadelphia (1908) and Bainbridge of New York.[2]

To the best of my knowledge, my own observation is the first case to be reported in the United States of an apparent cure of tuberculous peritonitis of the exudative type by the sole means of therapeutic pneumoperitoneum, and I therefore feel justified in offering this preliminary report.

NOTE.—Since this article was completed, it has been my good fortune to be furnished with some additional experience on this subject. Dr. Max Einhorn of this city referred to me for examination a Greek girl, aged 24 years, who was suffering with a marked abdominal distention. Clinical as well as pneumoperitoneal roentgen-ray examination revealed general tuberculous exudative peritonitis. So far this patient has received two oxygen inflations with very marked improvement in the abdominal conditions.

48 East Seventy-Fourth Street.

2. The literature on this subject is given by Stein and Stewart in the monograph mentioned in Footnote 1.

ETIOLOGY OF HAY-FEVER IN ARIZONA AND THE SOUTHWEST *

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AND
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This investigation was made possible only by the cooperation of Prof. J. J. Thornber, head of the Botanical Department of the University of Arizona. Many of the questions that arose could be answered by no other person than Professor Thornber, to whom full credit is due for his share in our work.

Hay-fever is caused by the pollens of certain plants; these plants are virtually always the wind pollinated plants and not the insect pollinated. Sensitization to plant pollen can be determined satisfactorily only by cutaneous tests.

There are certain insect pollinated plants whose pollen contains a noxious element, which will give a positive skin test in certain individuals, and whose pollen will undoubtedly produce hay-fever symptoms if inhaled; yet we would emphasize that these pollens are never found in the air in any great quantity;[1] they are practically not a factor in the hay-fever situation, except in very exceptional instances, for example, when the flowers are deliberately smelled or are grown in great profusion in close contact with the patient, or perhaps in some cases in which they are used as room decorations. While roses, daisies, dandelions, sunflowers, goldenrod, etc., all of which are insect pollinated plants, will in certain individuals give a positive skin reaction, and while they are capable of exciting hay-fever symptoms on inhalation, they are seldom the cause of hay-fever, because these pollens are not present in the air in sufficient quantities. If skin tests with any of these pollens are made and a positive reaction is obtained, the conclusion must not be drawn that this pollen is the cause of the patient's hay-fever, for patients are often sensitized to pollens which are not the cause of their hay-fever. One must go further and make skin tests on these patients with the pollens of the various wind pollinated plants growing in the vicinity where the patient lives and known to be pollinating at the same time that the patient's symptoms occur. If this is done, it will usually be found that they will probably also show a reaction to some wind pollinated plant that begins to pollinate when their

* Read before the Seventh Annual Session of the Medical and Surgical Association of the Southwest, Phoenix, Ariz., Dec. 1, 1921.

1. Scheppegrell, William: Hay-Fever and Its Relation to One Hundred of the Most Common Plants, Trees and Grasses, M. Rec. 92: 230 (Aug. 11) 1917.

symptoms occur; this wind pollinated plant's pollen would be the pollen to choose to make an extract for treatment, rather than the pollen of the insect pollinated plant.

Although it is some wind pollinated plant that is virtually always responsible for the occurrence of hay-fever, not all wind pollinated plants cause hay-fever; there are many wind pollinated plants that are harmless from a hay-fever standpoint. Considering these plants

TABLE 1.—CLASSIFICATION OF ALL PLANTS FROM STANDPOINT OF HAY-FEVER

All Plants are either:

1. Water pollinated — Never cause hay-fever
2. Close pollinated — Never cause hay-fever
3. Insect pollinated — Do not cause hay-fever except in exceptional instances as
   1. When flowers are deliberately smelled
   2. When plants grow in great profusion in immediate vicinity of patient
   3. When used as room decoration
4. Wind pollinated

	Group 1 Cause Hay-Fever		Group 2 Do Not Cause Hay-Fever
	Tribe	Common Name	
I. Gramineae or Poaceae (Grass Family) by Tribes	1. Maydeae	Corn	All wind pollinated plants not especially mentioned under Group 1
	2. Andropogoneae	Sorghum	
	3. Zoysieae	Galleta grass	
	4. Paniceae	Millet	
	5. Oryzeae	Rice	
	6. Phalarideae	Canary grass	
	7. Agrostideae	Bent grass	
	8. Aveneae	Oats	
	9. Chlorideae	Finger grass	
	10. Festuceae	Fescue	
	11. Hordeae	Barley	
	Genus	Common Name	
II. Compositae (Composite or Sunflower Family) by Genera	1. Artemisia	Wormwood	
	2. Ambrosia	Ragweed	
	3. Franseria or Gaertneria	False ragweed	
	4. Iva	Marsh elder	
	5. Xanthium	Cockle bur	
	6. Hymenoclea	Jecote	
	7. Parthenice	No common name	
	8. Dicoria	No common name	
	9. Parthenium	No common name	
III. Amaranthaceae (Amaranth or Tumbleweed Family) by Genera	1. Amaranthus	Amaranth	
	2. Acnida	Water hemp	
IV. Chenopodiaceae (Lamb's Quarters or Goosefoot Family) by Genera	1. Chenopodium	Goosefoot	
	2. Atriplex	Salt bush	
	3. Salsola	Russian thistle	
	4. Cycloloma	Winged pigweed	
	5. Eurotia	Winter fat	
	6. Sarcobatus	Grease wood	
	7. Suaeda or Dondia	Sea blite or Alkali weed	
	8. Grayia	No common name	
	9. Salicornia	Glasswort	
	10. Monolepis	Patota	
V. Polygonaceae (Buckwheat or Smartweed Family) by Genera	1. Rumex	Dock	
VI. Plantaginaceae (Plantain Family) by Genera	1. Plantago	Plantain or ribwort	
VII. Certain Trees by Genera notably	1. Populus	Cottonwood	
	2. Fraxinus	Ash	
	3. Quercus	Oak	
	4. Juglans	Walnut	
	5. Hicoria or Carya	Hickory	
	6. Juniperus	Cedar	
	7. Acer	Maple	
	8. Ulmus	Elm	

placed in botanic families, there are six families, together with a group of certain trees, that contain practically all of the wind pollinated plants that may cause hay-fever. This makes seven groups: (1) *Gramineae* or *Poaceae* (grass family); (2) *Compositae* (composite or sunflower family); (3) *Amaranthaceae* (amaranth or tumbleweed family); (4) *Chenopodaceae* (goosefoot or lamb's quarter family); (5) *Polygonaceae* (smartweed or buckwheat family); (6) *Plantaginaceae* (plantain family), and (7) certain trees.

This list applies, not only for Arizona and the Southwest, but for the entire United States; a hay-fever plant, wherever growing, will almost always be found a member of one of these groups.

The seven groups may be still further divided into genera, and the genera subdivided into species in all families. In some of the larger families, as *Gramineae* and *Compositae*, the genera are grouped into tribes; in the smaller families there is no grouping into tribes, but the family is directly subdivided into genera. This is all shown in Table 1. The various species in any group are not included, because it would make the table too cumbersome. This table has been constructed so that one may use it to determine, at a glance, whether or not any plant under consideration is a factor in the production of hay-fever.

As it has been definitely proved that hay-fever is due to the pollen of wind pollinated plants, before one can rationally treat hay-fever, one must know what plants of this type are in the patient's vicinity and which ones produce hay-fever. To obtain this information, it is first necessary to make a census of all wind pollinated plants, with data as to their location, profusion of growth, amount of pollen and time of pollination and to gather the pollen of the plants which are possibly a factor and perform cutaneous tests for sensitization.

Grant Selfridge[2] of San Francisco, with the aid of Prof. H. M. Hall of Berkeley, began an investigation having to do with the Pacific Coast pollens, and at the time our work was started he was the only western man, so far as we know, who was doing any work on this problem, with the single exception of Key[3] of Texas, who showed that a certain winter type of hay-fever prevalent in his section of Texas was due to Mountain Cedar (*Juniperus sabinoides*). Since beginning his work several years ago, Selfridge has done much to clarify his part of the western hay-fever problem (California), and much credit is due him. If our botanic flora were only the same as that of California, which those not familiar with the variations of botanic flora might expect, on account of our joining California on the west, Selfridge would already have solved a number of our problems for us; unfortunately, however, west of the Mississippi basin the botanic flora of the country is divided into three distinct areas. The plants of each area differ from one another, and all differ from the flora of the rest of the country.

These areas are the Pacific Coast area, including the coast region of California, Oregon and Washington; the Rocky Mountain area, including the Black Hills of South Dakota, Colorado, Wyoming, the eastern half of Utah, southern Idaho, Montana, northern New Mexico and adjacent Arizona; and the Southwestern area, including southwestern Texas, the southern half of New Mexico, all of Arizona except the extreme northern part, southeastern California, and northern old Mexico. In spite of the variations in altitude in Arizona and the Southwest, the flora differs very little, until an altitude of about 4,500 feet is reached, when the flora resembles the Rocky Mountain region.

Owing to the difference in climatic conditions, etc., in the Southwest, the hay-fever problem is different and more complex than in the Eastern, Southern or Central states, for the reasons that: (1) The season

2. Selfridge, Grant: Spasmodic Vasomotor Disturbances of the Respiratory Tract, with Special Reference to Hay-Fever, California State J. Med. **16**: 164 (April) 1918.

3. Key, S. N.: The Etiology of Winter Hay-Fever in Texas, Texas State J. Med. **13**: 308 (Jan.) 1918.

for pollination is a long one, frequently from the last of January or first of February, until the first or middle of November. (2) There is a great variety and an abundance of wind pollinated plants. (3) The relatively low humidity and meager rainfall favors wind pollination. (4) The variation in the annual rainfall results in a changeable flora to a certain extent. For example, abundant winter rain favors one type of flora and light winter rain and abundant summer rainfall favors another type, so what causes hay-fever one year may not cause it the following year. Although our assertion is not founded on statistics, it appears that there is considerably more hay-fever in Arizona and the Southwest than the usual 1 per cent. in other regions. From these facts we believe that the problem here assumes more importance than in other areas.

As stated before, plants to be an important factor in hay-fever must be wind pollinated; in addition, their pollen must be susceptible of being carried a considerable distance and therefore must be small and buoyant; they must grow in profusion and produce abundant pollen; they must be located near enough habitations so that their pollen can be carried this distance by the wind; their fluorescence must be associated with hay-fever; they must produce positive skin tests. In indicating the plants of importance in the hay-fever problem in Arizona and the Southwest, all of the foregoing prerequisites have been considered in submitting the list of wind pollinated plants given in Table 2, which includes all plants growing in any abundance in Arizona that are capable of producing hay-fever. Probably the majority exist in so few places and grow in such amounts that they are not a factor, except in very occasional cases. In presenting this list, we believe it as complete as it is possible to make it. In indicating the relative importance of the various species of plants in the hay-fever problem, however, we wish it understood that further experience will show changes, particularly by elimination in those plants marked of secondary importance, and so we submit their relative importance as a working basis subject to future revision.

TABLE 2.—PLANTS CAPABLE OF PRODUCING HAY-FEVER IN THE SOUTHWEST

I. Gramineae or Poaceae	Grass family
Tribe Maydeae	
Zea mays	Corn
	Corn
Tribe Andropogoneae	Sorghum grasses
Andropogon sorghum halepensis	□ Johnson grasses
Andropogon sorghum vars.	Cultivated sorghum
Andropogon saccharoides	Silver top
Andropogon halepensis sudanensis	Sudan grass
Tribe Zoysieae	Galleta grasses
Hilaria cenchroides	Texas mesquite
Hilaria rigida	Desert galleta
Hilaria mutica	Galleta grass
Tribe Paniceae	The millet grasses
Panicum sanguinale	Crab grass
Tribe Oryzeae	Rice grasses
Tribe Phalarideae	Canary grasses
Phalaris caroliniana	Southern canary grass
Tribe Agrostideae	Bent grasses
Aristida fasciculata	□
Aristida divaricata	Texas poverty grass
Aristida scabra	Texas poverty grass
Muhlenbergia gracilis	Mountain bunch grass
Polypogon monspeliensis	□ Beard grass
Sporobolus wrightii	□ Sacaton grass
Sporobolus airoides	□ Fine-top alkali grass
Sporobolus interruptus	
Agrostis exarata	
Tribe Aveneae	Oat grasses
Avena fatua	Wild oats
Avena sativa	Cultivated oats
Tribe Chlorideae	Grama grasses
Bouteloua gracilis	○ Blue grama
Bouteloua hirsuta	○ Hairy grama
Bouteloua rothrockii	○ Rothrock's grama
Bouteloua aristidoides	○ Six weeks grama
Bouteloua radicosa	□ Spruce-top grama
Bouteloua barbata	Six weeks grama
Bouteloua procumbens	Carpet grama
Bouteloua eriopoda	□ Wire grama
Capriola dactylon	⊕ Bermuda grass
Chloris elegans	□ Annual finger grass
Tribe Festuceae	Fescue grasses
Bromus arizonicus	□ Arizona brome grass
Tridens pulchella	□ Low desert grass
Arundo donax	Giant reed grass
Eragrostis major	○ Stink grass
Eragrostis pilosa	□ Love grass
Distichlis spicata	□ Salt grass
Poa annua	□ Annual spear grass
Poa pratensis	⊕ Blue grass (June grass)
Poa fendleriana	□ Mutton grass
Tribe Hordeae	Barley grasses
Agropyron smithii	○ Western blue grass (Wheat grass)
Agropyron pseudorepens	○ Slender wheat grass
Hordeum sativum	Cultivated barley
Hordeum murinum	○ Wall barley (Foxtail)
Horedum jubatum	○ Squirrel tail
II. Compositae	Sunflower family
Artemisia tridentata	□ Sagebrush
Artemisia filifolia	□ Narrow leaf sage
Artemisia dracunculoides	□ Tall wormwood
Artemisia gnaphaleides	□ Mugwort
Artemisia canadense	□ Canadian wormwood
Artemisia biennis	Annual wormwood
Ambrosia aptera	□ Tall ragweed
II. Compositae—Continued	Sunflower family
Ambrosia psilostachya	□ Western ragweed
Franseria ambrosioides	□ Bur ragweed
Franseria discolor	□ Low ragweed
Franseria acanthicarpa	□ Prickly ragweed
Franseria tenuifolia	○ False ragweed
Franseria deltoidea	○ Rabbit bush
Franseria dumosa	□ Desert ragweed
Iva xanthifolia	□ Marsh elder
Iva ambrosiaefolia	□ Coarse ragweed
Iva axillaris	□ Poverty weed
Xanthium commune	□ Common cockle bur
Hymenoclea monogyra	□ Jecote
Hymenoclea salsola	
Dicorea brandegii	□ No common name
Dicora canescens	□ No common name
III. Amaranthaceae	Pigweed or Tumbleweed
Amaranthus palmeri	⊕ Careless weed (Bledo)
Amaranthus retroflexus	⊕ Redroot (pigweed)
Amaranthus graecizans	□ Tumble weed
IV. Chenopodiaceae	Lamb's quarter (Goose foot
Chenopodium album	□ Lamb's quarter [family)
Chenopodium incanum	□ Desert lamb's quarter
Chenopodium fremontii	□ Western lamb's quarter
Atriplex rosea	□ Red orach
Atriplex wrightii	⊕ Annual saltbush
Atriplex elegans	□ Annual saltbush
Atriplex canescens	⊕ Shad scale
Atriplex canescens linearis	○ Mesa shad scale
Atriplex polycarpa	○ Many seeded saltbush
Atriplex lentiformis	○ Silver and gold saltbush
Salsola pestifer	○ Russian thistle
Cycloloma atriplectifolia	□ Winged pigweed
Eurotia lanata	□ Winter fat
Sarcobatus vermiculatus	□ Greasewood
Dondia suffrutescens	□ Quelite salado
Dondia moquini	□ Quelite salado
Monolepis nuttallianus	□ Patota
V. Polygonaceae	Buckwheat or Smartweed
Rumex hymenosepalus	□ Canaigre [family
Rumex crispus	□ Curled dock
Rumex mexicanus	Mexican dock
VI. Plantaginaceae	Plantain family
Plantago lanceolata	Ribbon grass
Plantago fastigiata	○ Indian wheat
Plantago ignota	□ Indian wheat
VII. Miscellaneous trees	
Salicaceae	Cottonwood or Poplar fam-
Populus wislizeni	○ Native cottonwood [fly
Populus acuminata	○ Black cottonwood
Populus angustifolia	○ Narrow-leaf poplar
Populus macdougali	⊕ Macdougal's cottonwood
Oleaceae	Olive or Ash Tree family
Fraxinus Toumeyi	□ Arizona ash
Fagaceae	Oak family
Quercus turbinella	□ Scrub oak
Quercus emoryi	□ Bellota (Black oak)
Quercus oblongifolia	□ Blue oak
Quercus arizonica	□ Arizona oak (White oak)
Quercus submollis	□ Post oak
Juglandaceae	Walnut family
Juglans major	Arizona walnut
Aceraceae	Maple family
Acer negundo	Box elder

Key: □ Plants probably of secondary importance; ○ plants probably of primary importance; ⊕ plants probably the very most important of those of primary importance; plants probably of little importance are all those that are not marked with any of foregoing symbols.

DESENSITIZATION

It has been stated by two or three investigators, particularly by Scheppegrell [4] and by Goodale,[5] that a patient sensitized to any grass may be desensitized by an extract made from any other member of the grass family and particularly timothy; also that a patient sensitized to any member of the *Compositae* may be desensitized by any other member of the same family. Sheppegrell [4] has gone even further and grouped all *Rumex* (*Polygonaceae*), chenopods and amaranths together, asserting that they are so closely related that any member of the three groups may be used to desensitize against any other member of the same three groups. It is our opinion that further study and observation will prove that these statements are incorrect. Our skin tests and study have already convinced us of this, and we believe that the continued promulgation of these ideas, which many men accept as true, simply tend to confuse the subject and retard results. For example, we have found here that most reactions in the grasses are due to Bermuda grass; and most of the hay-fever that we have seen caused by grass was caused by Bermuda grass. According to the prevalent expressed opinion, hay-fever patients sensitive to Bermuda grass could be desensitized by using an extract of timothy pollen. We do not believe this, for the larger number of our cases who showed a reaction to Bermuda grass were absolutely negative to timothy. The same thing obtains in the *Compositae*—there were several patients who reacted to *Franseria tenuifolia* (slender ragweed), for instance, who gave no reaction to *Ambrosia elatior* (common ragweed), although both of these are *Compositae* and belong to the ragweed tribe. There were any number of patients who reacted to *Amaranthus palmeri* (careless weed) who gave no reaction at all to *Rumex* (docks) or chenopods (goosefoots). According to Scheppegrell,[4] any of these three should desensitize for any of three others, for they are all members of his chenopod group.

Certainly no one could expect to desensitize with any pollen that would not show a skin reaction. Such reasoning is not logical, and is, we believe, the result of trying to simplify the treatment problem too far. We think that, in all probability, it will be shown ultimately that for the grasses, one member of the same tribe may have the same noxious element as all the other members of that tribe, and so it may be used to desensitize against any other member of the same tribe; and in other families, any member of a genus may probably be used in like manner. In other words, we believe that finally it will be shown that one may desensitize to some pollen by any other member of that pollen's genus or possibly tribe, but not by any member of the family or different families, though even this might occur in exceptional instances. It is to be remembered, however, that an extract of the particular species of pollen which is shown by the skin test to be the offender is always the pollen extract to use. It is very likely that one of the reasons more perfect results are not secured in the treatment of this disease (outside, of course, of the cases caused by animal emanations, bacteria, food, etc.) is that the treatment has not been specific enough, that is, it has depended too much on large group reactions. While these group reactions certainly occur to a certain extent in the grass family, and in the ragweed tribe of the *Compositae* family, yet they do not in a great many instances. The utilization of the principle of group reactions in diagnosis and treatment may be quite satisfactory in the Central, Southern and Eastern states, where the great majority of hay-fever cases is caused by one member of the grass family (timothy) and one member of the ragweed tribe (common ragweed). But in view of our observations in the Southwest, where there are many other factors, the use of this principle in the situation here, it appears, would not only produce unsatisfactory results, but would retard hay-fever progress.

TREATMENT WITH POLLEN EXTRACTS

The attempt to relieve hay-fever in the Southwest by stock pollen solutions based on group reactions, with no attention paid to the marked difference in flora between the East and the West, will largely fail. Selfridge [6] of California has called attention to this fact. The components of stock pollen solutions heretofore sold by drug houses are based on the flora of the East, not of the West. This method of treatment in the Western states is all the more irrational since it has been shown by Walker [7] that it is advisable to use a single pollen extract if possible, and make a maximum injection contain from 2,000 to 2,500 units of pollen extract, which is impossible with an extract containing four or more plant pollens. If good results are going to be obtained in the treatment of hay-fever in the Southwest, it would seem necessary to administer the pollen extract of the specific offending plant. This method will be available soon, as at least one commercial pharmaceutic house is already making extracts of the pollens responsible for hay-fever in this section of the country, and we are informed that these will be available for making skin tests and desensitization in the near future.

CONCLUSIONS

1. In distinction to the Rocky Mountain region, the artemesias (wormwoods) have little if any importance in producing hay-fever in the Southwest.

2. Amaranths are an important factor, and their pollen is very active; in fact, it will probably be shown that amaranths here are the principal cause of fall hay-fever, taking the place of the ragweeds in the East and the artemesias in the Rocky Mountain region. Some seasons *Atriplex wrightii* will probably take the place of *Amaranthus palmeri*. *Franseria tenuifolia* is probably a less important cause of fall hay-fever.

3. *Capriola dactylon* (Bermuda grass), causing the spring, summer and fall types, will probably prove to be the common grass causing hay-fever at altitudes up to 4,500 feet, and *Poa pratensis* (June grass) above that altitude.

4. *Gaertneria deltoidea* (rabbit bush) and *Atriplex canescens* (shad scale) are probably the most important plants causing the spring type of hay-fever.

5. Trees are probably not an important factor in causing hay-fever; but when they do cause it, they cause a very early type, and the most important trees are, first, cottonwood and, second, ash.

6. The principle of group reactions is not applicable to the hay-fever situation in Arizona and the Southwest.

7. It is advisable therapeutically to administer the specific pollen or pollens responsible for hay-fever.

123 South Stone Avenue.

4. Scheppegrell, William: The Classification of Hay-Fever Pollens from a Biological Standpoint, Boston M. & S. J. **177**: 42 (July 12) 1917.

5. Goodale, J. L.: Pollen Therapy in Hay-Fever, Boston M. & S. J. **177**: 42 (July 8) 1915.

6. Selfridge, Grant: Endocrine Glands and Their Relation to Vasomotor Disturbances of the Air Passages, Hay-Fever and Asthma, with the Past Year's Report, California State J. Med. **17**: 106 (April) 1919; **17**: 139 (May) 1919.

7. Walker, I. C.: Frequent Causes and Treatment of Seasonal Hay-Fever, Arch. Int. Med. **28**: 71 (July) 1921.

CALCULATING DIETS CONTAINING A MINIMUM AMOUNT OF CARBOHYDRATE

FOR THE TREATMENT OF ARTHRITIS

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The question of the influence of diet on the excretion of increased amounts of the acetone bodies, acetone, acetoacetic acid, and beta-hydroxybutyric acid in the urine, has been discussed for many years. It has been recognized for a long time, first, that fat, either fat fed or fat drawn from the reserve supplies of the body, furnishes the principal source of these compounds, and, secondly, that in general these compounds are not found except when the organism is burning decreased amounts of glucose. Such a failure to burn glucose may result from a deficiency of foodstuffs furnishing this compound in the diet, or from an inability of the organism to oxidize the food properly when supplied, as in diabetes. The acetone bodies found during starvation are formed largely from the body fat, and are present in increased amounts because of the absence of carbohydrate intake and the depletion of the glycogen stores of the body. Besides fats, which form the source of the larger part of the acetone bodies, protein—specifically leucin, tyrosin and phenylalanin, which form a part of the protein molecule—furnishes an additional source of these compounds.

In three papers recently published, Shaffer [1] has discussed the relationship which glucose and fat burned in the body must bear to each other to prevent the appearance of acetone in the urine, and has suggested a diet which will prevent the appearance of these compounds, and which will not furnish more glucose to the subject than is necessary for this purpose. In calculating this diet, he made allowance for the amount of glucose which can be derived from the glycerin residue of fat. Woodyatt [2] has published similar calculations, and has come to conclusions similar to those reached by Shaffer. Holmes [3] has published a paper in which the calculations of Woodyatt are discussed and illustrated by tables.

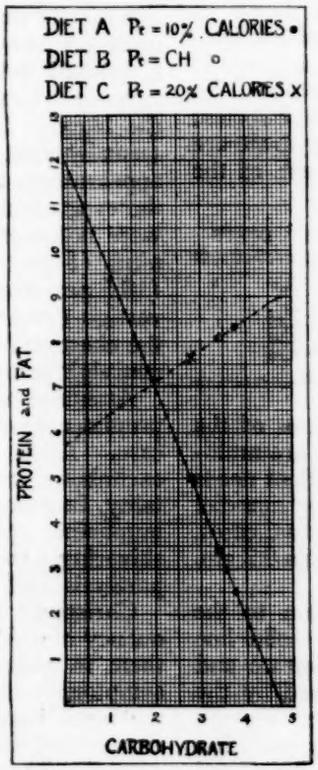

Chart for calculation of diets.

Pemberton [4] has stated that diets low in carbohydrate are of value in the treatment of arthritis; by using diets similar to those suggested by Shaffer and Woodyatt, it has been found possible in this clinic to furnish very small amounts of this foodstuff, with a very slight disturbance of the general metabolism. Preliminary reports of the effects observed have been published by Wright and Hubbard [5] and by Hubbard. [6] Further studies were reported by Hubbard, Wright and Nicholson at the meeting of the American Society of Biological Chemists, in December, 1921. In the present communication there is presented a method for calculating the diets used which has been found convenient.

For the purpose of calculating such diets, it is necessary that some idea of the probable metabolism of the patient should be formed. If this is not done, and a diet is fed which contains less food than the patient actually needs, material will be drawn from the tissues to furnish the balance, and this material is largely fat. If the diet received by the patient is low in carbohydrate, the fat so utilized may lead to the production of acetone bodies when they would not be formed otherwise. In the cases treated here, the basal metabolism was determined by the Benedict calorimeter [7] (estimation of the basal metabolism of the subject from the height and weight tables of Du Bois [8] could be used for the purpose) and the probable metabolism of the subject was estimated from the data obtained. The number of calories furnished above the basal requirement varied with the activity of the patient. The weight of a patient who was practically bedridden was maintained unchanged for more than a month when a diet which furnished 20 per cent. more calories than the basal requirement was fed, but it was necessary to feed as much as 50 per cent. more than the requirement to maintain the body weight of patients who were not bedridden, but whose activity was markedly limited by their condition.

After estimating the calories burned by the patient, diets containing the smallest amount of carbohydrate which would prevent the appearance of acetone in the urine were fed to him. Ten per cent. of the total calories so estimated were fed as protein, 20 per cent. as carbohydrate, and the balance as fat, or, for each hundred calories fed, 2.5 gm. of protein, 3.75 gm. of carbohydrate, and 8.35 gm. of fat were provided. The amount of protein was kept lower than that generally fed to reduce as much as possible the increase in metabolism which that foodstuff produces. In spite of the low intake of protein, nitrogen equilibrium was maintained by the diet.

Since both protein and carbohydrate furnish glucose to the organism, it is evident that a change in either of these constituents of the diet should be accompanied by a change in the other, if the total amount of glucose furnished is to be kept as low as possible. The full line on the accompanying chart shows the various combinations of protein and carbohydrate, expressed as grams per hundred calories, which will furnish the minimum of carbohydrate needed. It should be stated that diets containing less than 2 gm. of protein for each hundred calories are probably not practical, as they cannot be easily fed in a way that will maintain nitrogen equilibrium, while diets containing relatively large amounts of protein—more than 6.5 gm. for each hun-

1. Shaffer, P. A.: J. Biol. Chem. **47**: 433, 449 (July) 1921; **49**: 143 (Nov.) 1921.
2. Woodyatt, R. T.: Objects and Method of Diet Adjustment in Diabetes, Arch. Int. Med. **28**: 125 (Aug.) 1921.
3. Holmes, W. H.: Simplification of Woodyatt Method for Calculating the Optimal Diabetic Diet, J. A. M. A. **78**: 22 (Jan. 7) 1922.
4. Pemberton, R.: Am. J. M. Sc. **63**: 678 (May) 1917.
5. Wright, F. R., and Hubbard, R. S.: New York State J. M. **21**: 403, 1921.
6. Hubbard, R. S.: J. Biol. Chem. **49**: 357 (Dec.) 1921.
7. Benedict, F. G.: Boston M. & S. J. **178**: 667 (May) 1918.
8. Lusk, Graham: The Elements of the Science of Nutrition, Ed. 3, Philadelphia, 1917, pp. 126-129.

dred calories—should be avoided because of their increase on the metabolism which this food causes. The amounts of protein discussed by Holmes—from 1 to 2.5 gm. per kilogram of body weight—fall into this range of values. When the amount of protein to be fed has been determined, the amount of carbohydrate which must be fed for every hundred calories, if a minimum intake of glucose is to be fed, can be read directly from the chart. Find the point on the solid line at which the horizontal line corresponding to the number of grams of protein for each hundred calories crosses it, and drop a perpendicular to the bottom of the chart; the reading at this point represents the corresponding amount of carbohydrate expressed in grams. If it is wished to feed enough fat to maintain the body weight of the patient, the amount can be found by noting the point at which this vertical line crosses the dotted line in the chart, and reading the height of this point above the base line.

Three different diets, expressed as grams per hundred calories, are shown by points on the chart, and in figures in the table, to illustrate the method. In Diet A, protein forms 10 per cent. of the total calories; in Diet B the amounts of protein and carbohydrate are equal, and in Diet C protein forms 20 per cent. of the total calories.

GRAMS PER HUNDRED CALORIES IN THREE DIETS

Diet	Protein Gm.	Carbohydrate Gm.	Fat Gm.
A	2.5	3.75	8.35
B	3.4	3.4	8.10
C	5.0	2.8	7.70

The results are expressed in terms of grams of the foodstuffs for each hundred calories; if they are multiplied by the number of calories which the patient needs divided by 100, the result will give the border line diet for that patient. Such diets, when fed in actual cases, cause an excretion in the urine of not more than 0.2 gm. of acetone from all the acetone bodies.

The chart has a further value in relation to the treatment of diabetes. The points on the solid line represent different combinations of carbohydrate and protein fed for each hundred calories burned by the patient which will prevent the formation of acetone bodies, if the amounts so fed do not cause an excretion of glucose; and the corresponding points on the dotted line represent the amount of fat which must be fed simultaneously to maintain the weight of the patient. The effect of varying amounts of the different foodstuffs on the tolerance of diabetic patients for glucose, and, apparently, for fat also, makes the figures given in the chart represent a goal to be approached in the treatment of that disease rather than a guide to the foods to be furnished to the patient at any given time.

Serum Sickness from Local Application of Horse Serum on an Extensive Burn.—G. Blechmann and de Frenelle publish in *Hôpital* **9**:1043, 1921, what they believe to be the first instance of serum sickness from local application of horse serum. The woman of 30 had never had a previous injection of animal serum but had suffered from febrile polyarthritis several years before. The burn involved the left shoulder and neck. The amount of serum used daily was 40 c.c. After the tenth application the patient complained of pains in the joints of the left arm and in various muscle groups. By the thirteenth application, generalized urticaria appeared, becoming intermittent, with edema, punctiform erythema and joint pains even to the small joints of the foot, but no albumin in the urine.

A CASE OF CHOREA AND ERYTHREMIA

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The primary form of polycythemia with chronic cyanosis, known as erythremia, is a rare disease which was first observed by Rendu and Widal in 1891, and brought to the attention of physicians by Vaquez [1] in 1892. Since that time it has been called Vaquez' disease, Osler's disease and splenomegalic polycythemia. The rarity of the disease is emphasized by the work of Lucas,[2] who in 1912 compiled from the literature 179 cases of so-called polycythemia, of which he considered 149 as unquestionable cases of this disease.

The disease is of unknown origin, occurs most frequently between the ages of 40 and 60, affects males more frequently than females, and is characterized by a marked, persistent, absolute increase of red blood cells, and increase in viscosity and in total volume of the blood. Clinically it is characterized by cyanosis (usually most marked in the face with florid congested appearance), enlargement of the spleen, and changes in the eyegrounds. In the cases compiled by Lucas, there were noted particularly headache (31 per cent.); tinnitus (5 per cent.); lassitude, weakness and dyspnea (19.5 per cent.); asphyxiation attacks, palpitation and vertigo (34.5 per cent.); fulness in the head; pain in the chest and hypochondrium; cramps in the legs, and neuralgic pains in the toes and fingers.

Attention has been called on several occasions to the prominence of nervous symptoms occurring in this disease. Lucas enumerates apprehension, nervousness, excitability, irritability, hypochondriasis, disturbed mentality, insanity, delirium, insomnia, muscular atrophy, numbness, epileptiform attacks, muscular twitchings, shivering, tremor, loss of consciousness, aphasia, paralysis and choreiform movements.

Christian [3] particularly called attention to the frequency of nervous symptoms "because failure to keep them in mind has led to diagnostic mistakes." The symptoms which he mentioned were vertigo, fulness in the head, headache, pains, prickling sensations in the extremities, tinnitus, loss of consciousness, and blurring of vision. He reported ten cases, with nervous symptoms in eight. The most frequent symptoms were headache and dizziness, disturbance of vision (fatigue, blurring, scotomas, scintillating scotoma, transient blindness and diplopia), paresis and paralysis.

Marsh [4] reported fifteen cases, in eight of which there were symptoms referable to the nervous symptoms: headache, dizziness, auditory disturbances, nervousness, insomnia, disturbances of vision, loss of energy, numbness of extremities, loss of memory and paralysis.

Although the nervous system may be concerned in some way with the production of the various symptoms enumerated, in some instances it may not be primarily related to them. Some of the symptoms probably are accidental, as in a case of idée fixe (Cassirer and Bamburger [5]), probably insanity and hypochondriasis. Some of the symptoms are due to functional disturbance, as cerebral hyperemia: perhaps the headache,

1. Vaquez: Compt. rend. Soc. de biol., 1892, series 9, p. 384.
2. Lucas, W. S.: Erythremia, or Polycythemia with Chronic Cyanosis and Splenomegaly, Arch. Int. Med. **10**: 597 (Dec.) 1912.
3. Christian, H. A.: Am. J. M. Sc. **154**: 547 (Oct.) 1917.
4. Marsh, H. E.: Med. Clinics N. America **3**: 741 (Nov.) 1919.
5. Cassirer and Bamburger, quoted by Bordachzi (Footnote 7).

fulness in the head, dizziness, apprehension, nervousness, irritability, insomnia, etc. (A physician suffering from this disease described his feeling to me as "of being on constant tension, as he imagined a patient with a toxic goiter would feel.")

Some of the symptoms may be due to circulatory disturbance in the extremities, as prickling sensations and numbness. The visual symptoms (fatigue, blurring, scotomas, transient blindness, etc.) may be due either to affection of the optic nerve, the eyegrounds very frequently showing changes, at times a marked optic neuritis, or to organic change in the brain, as in the case of Hutchinson and Miller,[6] with loss of vision in which thrombotic softening was found in the occipital lobe. The symptoms referable to the ear, dizziness, Ménière's syndrome (three cases of Stern's quoted by Bordachzi), and tinnitus may well be due to labyrinthic disturbances.

Certain symptoms, however, seem to be based on organic changes in the brain. There are loss of consciousness, epileptiform attacks, muscular twitching, aphasia and paralysis.

Hemorrhages occur frequently in erythremia (in 23 per cent. of the cases, according to Lucas, who found 3 per cent. in the brain). Cerebral hemorrhage, therefore, may explain many of the cases of apoplectiform paralysis. Bordachzi especially mentions the cases of Cantley, Senator and Westhoeffer.

The increased viscosity of the blood predisposes to thrombosis; and, in the case of Hutchinson and Miller, there was thrombotic softening in the left lenticular nucleus and the right optic thalamus. Especially interesting is the case of Löwe and Popper (quoted by Bordachzi), in which there was a thrombosis of the carotid artery and cerebral arteries with ensuing encephalomalacia.

A case of polycythemia with chorea was described by Bordachzi[7] in 1909:

> A woman, aged 50, three months before admission to the hospital developed sudden twitchings, beginning in the right hand and spreading rapidly to the whole body. At the time of admission, she showed the picture of a severe chorea. She was very excitable, throwing herself forward and backward, bending and stretching the fingers, and to a smaller degree the hands and arms. Less frequently she moved the lower extremities at the knee and hip joints. She continuously grimaced. At times the movements became more vehement when she tossed around; she protruded the tongue, and the choreiform movements involved the muscles of the head and neck. The speech was slow, and, because of the continuous masticatory and tongue movements, hardly comprehensible. She was able to walk only with support and with great difficulty. Often the movements were so violent that she was unable to feed herself. About five months after the development of the chorea, the movements became less marked; and, seven months after the onset, she was able to leave the bed, shortly afterward being discharged as cured of the chorea.
>
> On admission, there was found 10,900,000 erythrocytes, 7,000 leukocytes, and a hemoglobin of 135. On the day of discharge, the erythrocytes numbered 9,300,000, the leukocytes 16,000, and the hemoglobin 115.

It is especially interesting that, during the patient's sojourn in the hospital, she developed a hematoma of the rectus abdominalis, and numerous cutaneous hemorrhages.

There was no history of endocarditis or rheumatism, and Huntington's chorea could be ruled out. Bordachzi thought that the chorea was the result of cerebral hemorrhage or thrombosis. He stated that only one observation would speak against such a hypothesis; namely, that whereas cerebral hemorrhage and thrombosis are common in erythremia, chorea had not been described as a symptom of that disease.

Particularly illuminating, both as to the possibility of chorea resulting from the effects of an erythremia and as indicative of the pathogenesis of hyperkinesis, is the case of Hutchinson and Miller in which twitching in the muscles of the face was observed, and the left lenticular nucleus and the right optic thalamus were found to be disintegrated. The inclusion of Huntington's chorea with other diseases, comprising the group of dystonia lenticularis, points to the possibility of the occurrence of chorea as the result of some lesion in the basal ganglions. What the nature of such a lesion may be will remain conjectural until histologic study of such a case is made.

REPORT OF CASE

The following case of chorea in erythremia is reported because of its rarity, to indicate further the possible causal relation of erythremia to chorea:

History.—F. W., a woman, aged 38, married, of Jewish extraction, was admitted to the Cook County Hospital, July 9, 1921, complaining of defective speech, involuntary movements of the extremities, and dyspnea. She had been taken ill six months before with dizziness, headache, vomiting, cyanosis and dyspnea. Usually the headache, dizziness and dyspnea occurred in attacks, more frequently occurring when the patient was recumbent. The attacks would begin suddenly, and would as suddenly and spontaneously disappear. They would last from half an hour to several hours. The headache consisted of a throbbing pain, the pain being accentuated at each heart beat. It was located in the frontal and occipital regions. It was worse on movement of the head. The dizziness was not a true vertigo, and consisted of blurring of vision, with the appearance of floating specks before the eyes and a feeling of impending loss of consciousness. Dyspnea usually occurred during the attack, and at this time the patient would note a marked cyanosis of the face. Vomiting, of sudden onset, not related to eating, nor associated with the attacks of dyspnea, occurred at irregular intervals. It was not projectile in type.

She consulted a physician, and was treated with radiotherapy and rapidly improved. For the last two months she had had no dizziness, vomiting or headache. Three weeks prior to admission, she noticed a defect in speech which rapidly became worse, to the extent that often her speech was unintelligible. At the same time she developed involuntary jerkings of her upper and lower extremities, grimacing, and similar movements of the jaws and tongue. These movements were uncontrollable, and produced marked interference with function, becoming so marked that she could not walk alone. They ceased during sleep and were increased on excitement. During the last week she had had marked and constant dyspnea, increasing on the slightest exertion.

Of past illnesses, she had typhoid fever thirteen years before, and measles, diphtheria, scarlet fever, smallpox, whooping cough and mumps as a child. There was no history of rheumatism, endocarditis, tonsillitis or a former attack of chorea. She had eight children, all living and well. The menstrual history was negative.

Examination.—The patient was short and stout. Her skin was cyanotic; there was a bluish-red tinge particularly involving the face and neck, where the color was more red than blue. The color of the skin over the chest, abdomen and extremities was not greatly changed from normal. The finger tips showed slight cyanosis, but no clubbing. The face was turgescent, the lips full, the eyelids heavy. The conjunctiva was markedly injected. The mucosa of the vagina and rectum appeared normal, whereas the lips and mucosa of the mouth were cyanotic. No adenopathy was present.

6. Hutchinson and Miller: Lancet **1**: 939 (March 17) 1906.
7. Bordachzi: Prag. med. Wchnschr. **34**: 253, 1909.

The heart and lungs seemed normal, and roentgenograms of the chest disclosed no pathologic condition. The abdominal wall was flabby, and there was some diastasis of the recti. The liver was not palpable. The spleen was definitely enlarged, firm and not tender; the splenic notch was readily felt. The systolic blood pressure was 140, the diastolic 90. The blood showed 8,100,000 erythrocytes; 8,500 leukocytes, and a hemoglobin of 115. There was rather marked anisocytosis. The urine was negative. There was no rise in temperature. Neurologic examination showed the deep reflexes to be variable, but equal and within normal limits. The superficial reflexes were normal. The pupils were equal, regular, and reacted promptly to light and accommodation. No bladder or rectal disturbance was present. Ophthalmoscopic examination revealed only engorged vessels. No extra-ocular muscle disturbance was found, and with the exception of the choreiform movements of the face, jaws and tongue, the cranial nerves were normal. Sensation was nowhere disturbed. There was no paralysis or muscular atrophy.

Incessant choreiform movements were observed affecting the head, trunk and extremities. The patient was unable to stand alone or walk. When lying in bed she was in continuous motion, twisting from side to side. The upper extremities and face were involved more than the trunk and legs. The upper extremities showed continuous, purposeless involuntary movements, more marked proximally, with rapid jerking of the muscles involved. There seemed to be two components to the movements, a rapid and a slow one. The rapid movement affected chiefly the flexors, but frequently the extensors as well; after a sudden jerk in a group of muscles there occurred a relaxation and a slower movement in the opposite direction. The movements were brusque, irregular, followed no anatomic plan, and were quite uncontrollable. They were inimitable, and increased markedly on excitement. She grimaced incessantly, and the movement of the jaws and tongue was so marked that eating was very difficult, and speech at times so impaired as to make it unintelligible. Frequently, contractions occurred in the abdominal muscles, unaccompanied by respiratory irregularity or expiratory grunts. The legs were in constant motion, but the range of movement was not so great as in the arms. Twisting and tilting of the pelvis often occurred, and extension of the lumbar spine, producing marked lordosis, frequently took place. She was unable to feed herself, and disarranged her bedding continuously.

Treatment and Course.—Several venesections were performed, with no appreciable change in her condition. July 20, the long bones of the body were exposed to the roentgen rays, and this treatment was continued at weekly intervals. July 30, the movements were not so marked, and the dysarthria was less. August 8, she was markedly improved; there were 7,800,000 red cells to the cubic millimeter. She was discharged, August 22, the choreiform movements having ceased with the exception of some in the tongue. The dysarthria was barely noticeable. The red blood cells numbered 6,400,000. The spleen remained distinctly palpable; cyanosis was distinct, but much less pronounced than at entrance.

COMMENT

It is notable in the case of Bordachzi that the choreiform movements disappeared, although the erythremia persisted. It is indicative of the supposition that the choreiform movements are not produced by any change in the blood but rather by a definite pathologic condition in the brain, such as hemorrhage or thrombosis. The same observation is true in the case here reported. Although there was a diminution in the number of red cells, the amelioration of the hyperkinesia was entirely out of proportion to the change in the blood, spleen or cyanosis. The indications were against a direct relation of the changes in blood content to the chorea.

25 East Washington Street.

INEFFICIENCY IN PUBLIC HEALTH ADMINISTRATION *

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During the late war, efficiency was everywhere demanded. For a time, the term thrilled the nation. Later, through excessive use, it became a fulsome by-word. A few months of overaction was followed by exhaustion; when the war terminated, relaxation occurred and in the place of efficiency there followed a period of general inaction, which still continues in every field of human endeavor. Stress has been followed by rest, and efficiency has to a great extent been supplanted by inefficiency. This is true of public health activities to a greater or less degree almost everywhere; particularly is it true of some localities in which public health work of late has greatly declined with deplorable conditions in some instances resulting.

Mine is not a neutral mind, and, as the title indicates, it is in the nature of a criticism and, without doubt, will be productive of opposition; but it is intended to incite greater activity in public health work among health officials generally.

The causes of health work inefficiency are manifold. To enumerate these causes is not contemplated; only a brief mention of some of the principal ones will be attempted.

TWO CAUSES OF INEFFICIENCY

Ignorance and indifference on the part of the public regarding the value of efficient public health work are among the greatest hindrances to successful health administration. To overcome opposition and create active public interest in sanitation and preventive medicine should be the aim of all health workers. This branch of public health activity should be pushed until realization is attained and a most potent obstacle to public health work removed. How this work can best be accomplished should be left to the determination of the public health authorities, time and experience being required for its development and fulfilment.

In rural districts, where public health work is usually undervalued, a cause of inefficiency in health administration is found in the local boards of health. Obviously, if ignorance and indifference exist in the public mind, these will influence and hinder the activities of boards of health. What can be expected of a local board of health, the personnel of which is made up, principally, of members of the town boards? Deficient in sanitary knowledge and unwilling to acknowledge its benefits, many of its members become obstructionists to public health measures and hinder the activities of the health officer to an extent that may practically nullify his work.

If rural boards of health are to continue to exist, should they not do so as independent bodies and be clothed with ample powers to promulgate, regulate and enforce all needful sanitary measures? And should they not be compelled to meet at regular stated intervals of from four to six times yearly for the transaction of public health business, and receive for their services a per diem fee of not less than $5? The stimulus of a fee would induce attendance, and by this means the members would be speeded to action and better health work effected. In fact, if the members

* Read before the annual meeting of the Central New York Public Health Association, Syracuse, N. Y., June 7, 1921.

of every health board were paid a per diem fee for attendance on board meetings, health work, it is believed, would everywhere be greatly advanced and one of the chief causes of inefficiency in public health administration removed.

In every municipality, efficient health administration depends largely on the efforts of the health officer. If he is negligent of duty, indifferent to the responsibilities of his office, and wanting in aggressiveness and administrative ability health administration will fail under him in direct ratio to his deficiencies.

Many city boards of health are notoriously inefficient, and it is the belief of some sanitarians that all boards of health could be dispensed with without detriment to the public, and their places filled by single health commissioners, who should have full authority in matters affecting the public health within their municipalities.

SYSTEM FOR CITIES OF THE THIRD CLASS

A uniform, single headed health system for all third class cities should be enacted by the legislature, and full time health commissioners, with ample authority, should be placed in control of all health work. Sufficient funds for such work should be provided. A per capita tax of not less than 50 cents nor more than 75 cents, it is believed, would cover the ordinary health expenditures in cities of this class.

The health commissioner of a third class city should have an experience of not less than five years in the general practice of medicine, and have completed a course of public health instruction in hygiene and sanitation and complied with all of its requirements such as are now prescribed by the public health council for health officers. He should give full time to the discharge of his duties, and receive a salary of not less than $3,000 per annum with all necessary expenses paid. He should be empowered to appoint necessary assistants for the conduct of health work, and fix their salaries within the limit of the appropriations made therefor. His term of office and that of his appointees should be for not less than five years. Power of removal of appointees under the commissioner should be vested in him.

The health commissioner should be subject only to the authority of the state commissioner of health in matters affecting the public health, and to the local authorities, solely, as to money expenditures. He should have supervision and control over all health work, both private and public. All charity organizations undertaking any kind of welfare work involving the public health should not be permitted to engage in such work without his permission, as duplication in health work leads to inefficiency.

A public health system somewhat along the lines indicated would, it is believed, largely remove the present inefficiency in health administration which exists in the third class cities of the state.

SANITARY SUPERVISORS

As a further means of promoting health efficiency, sanitary supervisors have been appointed to supervise and assist in the proper enforcement of health administration within their sanitary districts. Particularly, it is the duty of the sanitary supervisor on the appearance of any communicable disease within his district to investigate the cause of the spread of the disease and, when necessary, institute measures for its control. He is also charged with the duty of studying the causes of excessive mortality from any disease occurring within his jurisdiction and to aid in the enforcement of the public health law and the provisions of the sanitary code.

If he is indifferent to the responsibilities imposed upon him and is deficient in administrative ability, health efficiency in his district will not be maintained. On the contrary, if he is properly qualified for his duties and is energetic in their discharge, health efficiency under him will attain a high standard, and his efforts will gain the approval and support of health officials and the general public.

CONTROL OF CONTAGIOUS DISEASES

In a locality not far distant, outside this sanitary district, where health administration work has seriously declined, conditions have existed, and others still continue, which disclose a state of gross inefficiency in the general conduct of health affairs which demand attention and for which correction should be undertaken. To illustrate the inefficiency of health control in this locality, two conspicuous instances are cited:

Within a county approximating 70,000 population are two cities. The larger has a population of nearly 24,000, and the smaller slightly more than 13,000. For this county in 1920, thirty-five deaths from communicable diseases are recorded in the published vital statistics reports for that year. Of these deaths, twenty-two were from measles, six from whooping cough, and seven from diphtheria. In the larger city, the deaths from measles numbered seven, from whooping cough one, and from diphtheria two. In the smaller city, the deaths from measles numbered eight, from whooping cough two, and from diphtheria three.

The striking feature of these deaths is the excessive mortality from measles, particularly in the smaller city, where they numbered eight. In this city, in early winter, measles first made its appearance and slowly spread over the city and extended into the adjoining towns. In this case, had the health authorities exercised proper vigilance, an epidemic could easily have been prevented and most, if not all, of the lives that were needlessly sacrificed to this disease would have been spared. Practically nothing was done to control the progress of the disease by the health authorities. Apparently, they were without knowledge of the gravity of the situation, and that human lives were being lost by their inaction was unknown to them. In fact, it is doubtful whether any one in this city realized the seriousness of the epidemic, or had previously known that eight deaths from measles occurred in this municipality within the space of a few weeks. Apparently, too, the sanitary supervisor, within whose district this excessive mortality from measles occurred, had no knowledge of the virulent character of the epidemic, as he did not, so far as can be ascertained, do anything to prevent the spread of the disease. He must have known that an epidemic of measles of large proportions was prevailing within his district, as the cases in the larger city, which is his home, numbered nearly 700; and only a few miles away, in the smaller city, they numbered 321 cases. It is evident that this large number of cases of measles did not escape his attention, and had he exercised the vigilance expected of a sanitary supervisor, a number of lives might have been saved.

There appears to be only one excuse for the negligence that cost so many lives. This is based on the widespread belief that measles cannot be effectively controlled and that nearly every person must, sooner or later, have the disease. This belief, too, is largely

shared by health authorities. This is erroneous and affords no legitimate defense for the loss of lives which the experience of energetic health officials has demonstrated may be saved by the exercise of an efficient control when first cases appear.

An epidemic of measles, or of any other disease, occurring in rural districts and the smaller cities may be controlled by the exercise of vigilance on the part of the health authorities. A few years ago, in a third class city, outside of which measles extensively prevailed, a health officer by vigilant work prevented an epidemic from occurring. Seven different times, within a year, the disease was brought into the city. Only twenty-two cases developed, more than half of which were among schoolchildren, and these came from the first case of the disease. In the six subsequent appearances of the disease only eight cases arose, all of which were confined to their original sources of six families, at widely separated points within the city. This is an excellent example of the control that can be exercised against the spread of a contagious disease by vigilant work on the part of health officers.

If measles produced the fear that cases of hydrophobia and smallpox do, they would rarely be seen, and epidemics from them would seldom or never occur.

Fear has always been a potent factor in the control of contagious diseases, and ever will be until the public has learned that these may be brought under effective control through the enforcement of existing sanitary regulations. Sooner or later, it will realize that this is possible, as well as desirable from an economic standpoint and, eventually, better control will prevail, and the contagious diseases which now flourish will largely disappear. This is not a dream, but something to be realized, which all health workers should seek to hasten.

Unquestionably, considerable time will be required to attain this desideratum. Energetic action by every one interested in public health work would, it is believed, decrease the communicable diseases to the extent of 50 per cent. within the space of a single year. This, however, cannot be accomplished under the present lax control.

Considerable inefficiency in health control work is due to the failure of physicians to live up to the rules and regulations of the sanitary code. Most physicians occasionally violate the regulations, and quite a number of them are constant violators, and it is these who harass the health officer in the performance of his duties and render his work inefficient.

Failure to report contagious diseases promptly is a potent factor in causing epidemics for which physicians are largely responsible. Enforcement of the penalties for these violations would greatly decrease their number. Health officers should try to prevent these offenses by promptly reporting the offenders to the state commissioner of health. If this were more often done, there would be fewer offenses to report and less to condone.

Failure to report communicable diseases, when no physician is in attendance, is a prolific cause in the spread of these diseases which, many times, end in serious epidemics. Parents, teachers, nurses and other persons whose duty it is to report cases of communicable diseases to the health officer should be held responsible for their neglect to comply with the regulations of the sanitary code. Too often, sanitary officers are guilty of condoing or overlooking these omissions of duty.

LAX ADMINISTRATION

Returning to the subject of health conditions in the smaller city previously mentioned:

Five years ago, in accordance with the rules and regulations of the sanitary code, there was established a system of milk inspection and grading with bimonthly bacteriologic examinations. This was continued with good results for more than two years, when, through the neglect and indifference of the health authorities, it was discontinued. No bacterial counts have been made during the last two years, and other milk inspection work has been greatly neglected, with the result that there has been a marked deterioration in the quality of the city milk supply.

Other equally valid criticisms of the conduct of the health affairs of this city could be made. Sufficient, however, has been said of what, without doubt, constitutes an inexcusable inefficiency in the administration of its health affairs.

It is certainly unpleasant to live in a locality in which health administration is so lax that, at any time, lives may be imperiled and lost through the spread of preventable diseases which efficient health control can prevent.

Unquestionably, there are other cities in which better health conditions prevail, and it is undoubtedly true that there are cities, still, wherein the health conditions are as bad as, and possibly worse than, in the city mentioned. The things which make these wide differences in health administration are many and can be determined only by a study of existing local conditions and the varying character of the health problems presented.

Insufficient funds for the proper conduct of health affairs may be the cause of inefficiency in one municipality, while in another it may arise from deficient help. In still another, both causes may be important factors. These may seriously hinder health administration, but the greatest of all hindrances is the lack of sufficient interest in their work by health officials.

In a sense, many health officers are merely accidents of our political system or of their environment, appointed usually without regard for qualifications. Too often, they manifest no real interest in health work, and the result is inefficiency. Obviously, the best remedy for inefficient health administration is a real interest in health work on the part of health officials. If they possess this, they will be earnest and energetic in their work, and success will attend their efforts.

CONCLUSION

Let every health worker keep in mind the words of Gladstone: "The health of the people is the foundation on which repose the power and happiness of any country, and the care of public health should be the first concern of every statesman." With these words ever in mind, inefficiency in health administration will be lessened and an era of better health work will prevail with ever increasing health improvement.

216 Oneida Street.

Physician Should Witness Operation on His Patient.—In more senses than one the operating theater may be made a link between the ward and the postmortem room. When a physician fails to witness the operations which are performed on his patients, he not only neglects a fruitful source of information for his own future guidance, but he also deprives the surgeon of the very great advantages which accrue from consultation on questions which may arise during the course of an operation.—Percy Sargent, *Brain* **44**:313, 1921.

Clinical Notes, Suggestions, and New Instruments

A METHOD OF RETAINING FREE FAT AND FASCIA TRANSPLANTS IN CLOSING DEFECTS IN THE DURA

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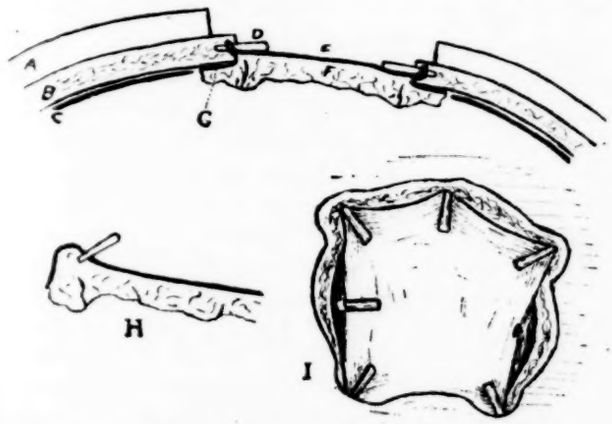
In certain cases of defect of the skull, the pia has become adherent to the bone at the margin of the defect and to the overlying skin. After the separation of the pia from the overlying structures, before closure can be attempted, it is necessary to fill up the defect in the dura. For this purpose a fat and fascia transplant is used, the fascia lata ordinarily being utilized for this purpose.

The present methods in use for holding the transplant in place between the brain and the skin and skull are not satisfactory. The slight bulging of the brain which accompanies the defect causes the transplant to slip out from between the brain and the skull, and after the operation the adhesions will again occur. If the transplant can be sewed to the dura, this objectional feature is eliminated.

It frequently happens, however, that the dura has retracted to some distance from the bone margins or has become adherent to the bone so that no sutures can be put in it without great danger of injury to the brain substance. Sutures



Method of retaining free fat and fascia transplants in closing defects in the dura: *A*, skin; *B*, bone; *C*, dura; *D*, peg; *E*, fascia; *F*, fat; *G*, free margin of fascia; *H*, method of inserting peg in fascia; *I*, five pegs in place, one ready to be driven into diploe, and puncture made for seventh.

to the periosteum are not satisfactory, as the graft then fills up the bony defect but does not protect the brain from the overlying bone.

In the method here described, the edges of the transplant extend under the bone edges and keep the brain and bone from touching. A piece of fascia lata with attached fat 1 inch (2.5 cm.) larger in each diameter than the defect to be filled is removed and trimmed down to the shape of the defect. Five or six small punctures are made in the fascia, equidistant and about one-half inch (1.25 cm.) from the margin. The transverse distance between the punctures is just less than the diameter of the defect to be filled. A previously prepared peg of beef bone or of the patient's tibia, three-quarters inch (1.9 cm.) long and one-eighth inch (3 cm.) in diameter, is inserted in each of the holes as shown at *H* in the illustration, and carrying the overlying fascia with it, driven into the diploe. After the graft is firmly in place, further pegs may be driven in to bring the fascia and bone in to closer approximation.

The pegs serve two purposes: (1) to attach the fascia to the bone, and (2) to prevent the free edge of the fascia from becoming doubled back under the attached portion. The fascia being doubled upon itself where the pegs are driven into the bone gives an increased amount and density at this point. This portion is held down by the projecting ends of the pegs and kept from bulging up into the wound. The free margin of the graft will remain in the place of least resistance, which is under the margin of the bone.

480 Maple Avenue.

AN UNUSUAL CASE OF ECTOPIC PREGNANCY

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It is of very little interest to report isolated cases, especially of a condition so frequently encountered in gynecologic practice as ectopic gestation; but the case to be described presented such unusual features that it was thought of sufficient importance to warrant a full description.

L. W., aged 37, admitted to the Lying-In Hospital, Feb. 24, 1921, had last menstruated, Dec. 15, 1920, and had felt well until the afternoon of the day of admission, when she had had violent abdominal cramps and had fainted twice. This story, with the patient's condition, which was evidently one of shock, rendered the diagnosis of ruptured ectopic pregnancy probable. The usual measures to combat shock were resorted to, and, about one and one-half hours after admission, a laparotomy was performed and the right tube and ovary, the former the site of a ruptured tubal pregnancy, were removed. The abdomen contained a considerable amount of fluid and clotted blood. A citrate transfusion of 900 c.c. was performed by Dr. J. R. Losee, while the patient was still on the table; her condition rapidly improved, and within a few hours she was fairly comfortable.

On the second day afterward she developed a consolidation of the right lower lobe. Two days later, the fourth day after operation, she developed a right parotitis; the pneumonia began to clear up, but the parotid increased markedly in size. Local applications were made to the right parotid region, and though there was considerable redness and edema of the overlying tissues, and the swelling so great at first that the patient could not open her mouth more than half an inch (12 mm.), the parotitis after seven or eight days began to subside and ultimately cleared up entirely.

On the second day after admission a detailed history was obtained from the patient, and then reference to the hospital records disclosed the features that make the report of this case interesting.

She had been admitted, March 25, 1917, with the history and symptoms of an ectopic pregnancy, and had been operated on by Dr. J. W. Markoe, March 27, when the left tube and ovary were removed for a ruptured ectopic gestation, about the size of a small orange. The abdomen was full of blood clots. In two days she developed signs of pneumonia, and on April 4, seven days after operation, she developed a marked left parotitis. This was incised, April 6, and, though no pus was obtained, a culture from the serum showed *Staphylococcus aureus*. By April 9 the swelling had almost entirely disappeared. She was discharged well, April 13.

An additional item of interest in connection with this case is that the patient was readmitted to the hospital one and one-half years later, Nov. 10, 1918, in active labor with non-engagement of the head. At that time, in view of the previous operation and the lack of progress, an abdominal cesarean section was performed by Dr. R. McPherson. On this occasion she went through a normal puerperium without any complications.

SUMMARY

This patient presents the following interesting features:

1. Laparotomy for left ruptured ectopic pregnancy in March, 1917, with pneumonia and left parotitis as complications.

2. Abdominal cesarean section in November, 1918.

3. Laparotomy for right ruptured ectopic pregnancy in February, 1921, with pneumonia and right parotitis as complications.

20 West Fiftieth Street.

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SATURDAY, MARCH 11, 1922

DELETERIOUS EFFECTS OF ACACIA FOR TRANSFUSION

The use of acacia for intravenous injections in the treatment of shock, hemorrhage and allied conditions has its supporters and opponents. Whereas the promoters had the field during the war, the opponents are now gradually coming into their own. The use of acacia, like some other therapeutic measures which suddenly appeared during the World War, was not based on that sober second thought which is especially valuable in determining the real value of any new therapeutic remedy or procedure. At least, however, it helped to serve one purpose, namely, the stimulation of research in shock. There is no longer any doubt as to the deleterious effects of the use of this substance.

Bayliss,[1] who introduced the intravenous use of acacia, originally showed that it can agglutinate cat corpuscles in vitro, although he regarded this as a temporary phenomenon and of no consequence in vivo. Acacia, however, like many other colloids, is a labile substance, and can change its properties and probably those of other colloids readily, so that, at another time, and depending on the conditions, it may agglutinate permanently and even cause injury. This was shown to be the case by the researches of Kruse[2] and of Hanzlik and Karsner.[3] These investigators demonstrated that acacia, in the concentrations in which it is used intravenously, agglutinates red blood corpuscles of man and other species. In addition, Hanzlik and Karsner demonstrated the presence of emboli and thrombi in the pulmonary vessels of guinea-pigs which showed anaphylactoid symptoms after intravenous injection of acacia. In their recent studies on blood fibrin in dogs, Foster and Whipple[4] of San Francisco show that intravenous injections of acacia interfere with the prompt return of fibrin to its normal value, the restoration after acacia being much slower than that after injection of Locke's solution. They show, further, that blood which is removed immediately after injection of acacia does not clot, and normal coagulation is obtained only by the use of serum. At times there is delay in coagulation for many hours. Therefore, its use would hardly be valuable in certain kinds of hemorrhages. Finally, Olivecrona[5] of Stockholm reports the death of a woman from the intravenous injection of acacia, and warns against its indiscriminate use. These reports are in harmony with the unfavorable opinions of some surgeons based on their experiences with it during the war,[6] and also with the statement of Stewart[7] of Cleveland that the use of acacia is unphysiologic.

Moreover, as pointed out by Henderson and Haggard[8] in this issue of THE JOURNAL, acacia solution, although apparently distinctly beneficial immediately after injection, does not improve the chance of recovery of animals which have been subjected to the so-called "standard hemorrhage." Its only value is the replacement of plasma, and such results are scarcely better than no treatment at all, since the really significant element in hemorrhage seems to be the loss of red corpuscles. It is the decrease in the capacity of the blood to perform its functions, and not chiefly the fall of arterial pressure, that is the critical factor in hemorrhage.

An additional lesson to be drawn from the results of these investigations is that the intravenous method of administering drugs is always accompanied by considerable risk of injury to the patient. It is unjustified with new and untried remedies, and even with those which chemically and pharmacologically appear to be inert and inactive.

1. Bayliss, W. M.: Intravenous Injection in Wound Shock, Brit. M. J. **2**: 553 (May 18) 1918.
2. Kruse: Am. J. Physiol. **49**: 137, 1919 (Proc.).
3. Hanzlik, P. J., and Karsner, H. T.: J. Pharmacol. & Exper. Therap. **14**: 379, 425 (Jan.), 449, 479 (Feb.) 1920.
4. Foster and Whipple: Am. J. Physiol. **58**: 393, 1922.
5. Olivecrona, H.: Acta chir. Scand. **45**: 1, 1921.
6. Robertson, O. H.: Central Med. Dept. Lab. Div. Surg. Research, A. P. O. 721, France, Oct. 27, 1918.
7. Stewart, G. N.: Am. J. Physiol. **49**: 233 (July) 1919.
8. Henderson, Yandell, and Haggard, H. W.: Hemorrhage as a Form of Asphyxia, J. A. M. A., this issue, p. 697.
9. Hess, A. F., and Unger, L. J.: Proc. Soc. Exper. Biol. & Med. **18**: 298, 1920-1921; The Cure of Infantile Rickets by Sunlight, J. A. M. A. **77**: 39 (July 2) 1921. Hess, A. F.; Unger, L. J., and Pappenheimer, A. M.: Experimental Rickets in Rats, III, The Prevention of Rickets in Rats by Exposure to Sunlight, J. Biol. Chem. **50**: 77 (Jan.) 1922. Heliotherapy and Rickets, editorial, J. A. M. A. **78**: 195 (Jan. 21) 1922.

RICKETS AND TETANY

The numerous recent contributions to the study of rickets indicate that a variety of factors may contribute to the pathogenesis of the disease. Out of the confusion of the earlier investigations on the experimental rickets of animals, in which characteristic osseous defects could be induced by a diversity of dietary deficiencies, clarity is beginning to ensue. Thus, it has been found that a serious deficiency in calcium or phosphorus or both in the food intake is a predisposing factor in rickets in both animals and human subjects. However, rachitic symptoms can be averted in many instances through exposure of the susceptible individuals to sunlight or ultraviolet rays; and cures can be effected when the signs of the disorder have already made their appearance.[9] An unidentified factor contained in cod liver oil can effect a similar cure or exert

a preventive influence. The current probability in respect to rickets has been summarized by expert investigators [10] in this field by the statement that when a rat, the favorite experimental animal in the study of this subject, is deprived of certain active light rays and an unidentified factor contained in cod liver oil, a pathologic condition corresponding in all fundamental respects to rickets in human beings can be produced through the diet in two ways: (1) by diminishing the phosphorus and supplying the calcium in optimal quantities or in excess, or (2) by reducing the calcium and maintaining the phosphorus at a concentration somewhere near the optimum. There is reason to believe that in the human being, similarly deprived of light and the unidentified factor, true rickets may arise through the maladjustment of the calcium and the phosphorus in the diet in the ways just mentioned.

The considerations outlined have recently led to the conviction that there may be more than one kind of rickets.[10] We are told that one is characterized by a normal or nearly normal blood calcium and a low blood phosphorus (low phosphorus rickets); the other by a normal or nearly normal blood phosphorus but a low calcium (low calcium rickets). It is well known that a low blood concentration of calcium is also characteristic of children suffering from manifest tetany.[11] An explanation, therefore, at length seems to be at hand for occasional but not invariable association of tetany with rickets. A recent writer [10] has pointed out that cases of rickets, even very severe rickets, exist in which tetany does not supervene, and, in all likelihood, never will. In other cases of rickets, tetany either in the manifest or in the latent form is present for weeks, and numerous observers have pointed out that it is with the less severe forms of rickets that tetany usually allies itself. If tetany is essentially an expression on the part of the nervous system of an insufficiency of the calcium ion, whereas rickets is the expression on the part of the skeleton of disturbed relations between the calcium and phosphate ions of body fluids, it is readily conceivable how the two disorders may be simultaneously manifested. Furthermore, the curative procedures should be made to vary with the indications. Experience has indeed shown, as Shipley, Park, McCollum and Simmonds have pointed out, that a cure in rickets accompanied by tetany is most easily accomplished through the administration of calcium and cod liver oil or by calcium and heliotherapy, whereas in rickets uncomplicated with tetany the cure is most readily accomplished by means of the administration of cod liver oil or heliotherapy with or without phosphate. The assumption that tetany is merely a sign of healing rickets [12] is no longer tenable.

With reference to the chemical nature of the curative factor in cod liver oil, some novel questions have been raised by the newer studies of rickets. Heretofore it has been identified, without specific evidence, with the "fat-soluble A" present alike in this oil and in butter fat, the vitamin concerned in growth and in the prevention of the ophthalmias that are liable to occur when the factor is missing in the diet.[13] But McCollum, Simmonds, Shipley and Park [14] have cast doubt on the identity of vitamin A and the antirachitic factor. Cod liver oil seems to be so much more effective than is butter fat in promoting the use of a low calcium supply by the osseous tissues that one may properly question whether there are not "two distinct organic factors operating in the nutrition of a mammal which is associated with certain fats." One of these is comparable in its action with sunlight; the other may not be. Heliotherapy, as well as chemotherapy, is entering on a new experimental era.

MEDICAL ENGLISH AS SHE IS WROTE

"Medical terminology," says Lubarsch, editor of *Virchows Archiv*, "has never distinguished itself by its exactitude, clarity and precision." He then yields to the impulse that has assailed many another medical editor, and relieves his emotions by scolding the tribe of medical authors.[15] He particularly directs his lance at the practice of misusing the word cirrhosis, a sin shared by both Teutons and Anglo-Saxons and which is of itself a none too pleasant commentary on the prevalence of loose writing by medical men. The word cirrhosis is applied to every possible sort of condition associated with hardening; for example, cirrhosis of the kidney as a synonym for chronic forms of nephritis with fibrosis. Probably the reason for this misuse lies in the fact that the cirrhotic liver is fibrotic or sclerotic, and that the word cirrhosis sounds not unlike sclerosis. But cirrhosis is from the Greek word meaning yellow or tawny, carries no reference to sclerosis, and was applied to the diffuse hepatic fibrosis because often the liver in this condition is yellow, either from fat or from bile. The sclerotic kidney, however, is not usually yellow, and the "cirrhotic" lung is generally black with coal pigment. At the best, cirrhosis is a poor term even for the hepatic fibrosis, since often the cirrhotic liver is far from yellow, and its only justification is usage.

Then there is apoplexy, used to designate hemorrhages into almost any part of the body, despite the fact that its Greek ancestor referred only to the loss of consciousness and paralysis which result from hemorrhage into the brain; in origin, apoplexy does not mean

10. Shipley, P. G.; Park, E. A.; McCollum, E. V., and Simmonds, Nina: Is There More Than One Kind of Rickets? Am. J. Dis. Child. **23**: 91 (Feb.) 1922.
11. Kramer, B.; Tisdall, F. F., and Howland, John: Observations on Infantile Tetany, Am. J. Dis. Child. **22**: 431 (Nov.) 1921.
12. Huldschinsky, K.: Die Beeinflussung der Tetanie durch Ultravioletlicht, Ztschr. f. Kinderh. **26**: 5, 1920.
13. Osborne, T. B., and Mendel, L. B.: Ophthalmia and Diet, J. A. M. A. **76**: 905 (April 2) 1921.
14. McCollum, E. V.; Simmonds, Nina; Shipley, P. G., and Park, E. A.: Studies on Experimental Rickets, XII, Is There a Substance Other Than Fat-Soluble A Associated with Certain Fats Which Plays an Important Rôle in Bone Development? J. Biol. Chem. **50**: 5 (Jan.) 1922.
15. Lubarsch, Otto: Einiges zur Kritik der medizinischen Namengebung, Virchows Arch. f. path. Anat. **232**: 480, 1921.

hemorrhage, for the apoplectic condition may result equally well from embolism or thrombosis unassociated with hemorrhage. A difference between infectiousness and contagiousness seems not to exist in the minds of some writers, while others describe the inoculation of animals or patients with serum, as if inoculation and injection were synonyms. The distinction between tuberculous and tubercular is apparently too subtle for many, including writers of excellent repute, who seem to forget that if there exist such things as tubercular leprosy, tubercular syphilids, and normal anatomic tubercles of many sorts, then the words tubercle and tubercular cannot possibly be understood to mean specifically infections with *Bacillus tuberculosis,* even if some of the lesions produced by this germ are tubercular; many tuberculous lesions are not tubercular, and many tubercular lesions have nothing to do with tuberculosis.

Perhaps the worst of it is that we keep on adding errors and monstrosities to our medical nomenclature, so that sometimes it seems more like a jargon than a language. Take the word vaccine. The word is as badly misused as the principle. Its classical parent means cow, and "vaccine" was used, of course, because cow pox was the disease transmitted by Jenner in the prophylaxis of smallpox. Certainly the present use of the word vaccination for injection of every possible sort of pathogenic bacteria, to say nothing of pollens and food proteins, has no justification on an etymological basis, and its use for all these things unrelated to the cow is an etymological bull. But, like many another atrocity of the same sort, its careless usage has become so widespread as to fix it, presumably for all time. We are, however, a little encouraged to see that some careful writers have made a slight impression on the prevalent error of speaking of deviation of complement when fixation of complement is meant. Some of these errors we owe to the Germans, who are remarkably lax in their scientific terminology, but one particularly grievous sin we get from the German literature through no fault of the Germans, namely, the literal translation of the compound adjective without rearranging it into English. From this source we get such sentences as "the blood contains bacteria destroying antibodies" when, of course, the reverse is meant, for the bacteria are destroyed, not the antibodies. We read, likewise, "albumin containing urine" or "blood destroying poisons," phrases that shriek loudly for at least a missing hyphen if they cannot have a real English construction. Sometimes it is necessary to rewrite a dozen sentences in a single article just to get around this failure to arrange in English form the translation of the gloriously compounded German adjective, concerning which Mark Twain wrote so lucidly and with so much feeling. As for the habitual and unlimited misuse and abuse of the words "case" by medical men and "operate" by surgeons, we have on other occasions expressed our views. The observant physician, however, is beginning to realize at least the fundamental rules governing their usage.

VIRCHOW AND MODERN PATHOLOGY

The year just closed marked the centenary of the birth of Rudolf Virchow, the founder of cellular pathology, with whose name the rise of modern medicine is inseparably connected.[1] Although the preeminent significance of the magnificent contributions to science so succinctly summarized in Virchow's aphorism *Omnis cellula e cellula* is highly appreciated in America, it may seem strange to many thoughtful persons that an anniversary so fraught with interest to medicine should have received so little public notice in scientific circles in this country. A partial explanation of the apparent apathy may be found in the remnants of nationalistic feeling inevitably engendered by the World War. It is a platitude that science knows no national boundaries; nevertheless, intense human passions and enthusiasms often tend for the time to obscure even the greatest of undeniable deserts elsewhere when motives of patriotism and loyalty have been aroused to express themselves. Such passing prejudices are characteristic of our social structure.

In the case of Virchow, however, there is little doubt that other factors have been responsible for the lack of expression of deserved enthusiasm on a memorable occasion. In the splendid volume of tributes to Virchow's genius edited by Lubarsch as a *Gedenkband* of the journal known everywhere as *Virchows Archiv,* which the great pathologist founded in 1847, James Ewing[2] of the Cornell University Medical College, New York, has ventured an interpretation of the influence of Virchow on medical science in America. He points out that at the most fruitful period of the German investigator's scientific activities, American students of medicine who traveled abroad were accustomed to wend their way to London, Edinburgh and Paris. The teachings of Virchow, however, found a ready acceptance in this country, not primarily by personal transmission through the intermediation of eminent pupils, as has happened, for example, in the dissemination of Ludwig's influence on the progress of physiologic research in the United States, but through the recognized publications of a great master. Indeed, Ewing ventures the belief that America possesses more copies of Virchow's writings than does any other country.

Furthermore, the rise of modern bacteriology under the leadership of Robert Koch somehow attracted a larger group of American students of the genesis of disease; their interest in micro-organisms as a domi-

1. Virchow Centenary, editorial, J. A. M. A. **77**: 1427 (Oct. 29) 1921; Celebration of Birthday of German Pathologist, ibid. **77**: 1903 (Dec. 10) 1921.

2. Ewing, James: Virchows Arch. f. path. Anat. **235**: 444 (Oct. 13) 1921.

nant factor in pathologic processes tended to overshadow the cellular aspects of the subject as championed by Virchow. Ewing has pointed out with ill concealed disapproval that in America the development of medicine on the basis of scientific procedures has been dominated by physiology, bacteriology and chemistry rather than general pathology, and further, that its progress has been directed in many instances by persons whose preliminary training has not been primarily medical. It is, after all, futile to evaluate the impulses and forces which lead to discovery and advancement of science. "There is glory enough for all." Perhaps the recollection of Virchow's fundamental belief that "there are no specific cells in disease, but only modifications of physiologic types," will act as a stimulus to awaken new enthusiasm for pathology as a fundamental discipline in medical studies. We need not bemoan the assumption that the pathologist is today looked upon by many as a servant of the clinic whose foremost duty is to furnish a record of bodily changes that have occurred, whereas the physiologist and biochemist appear to be in ascendency as the philosophers and guides of the clinician. It was Virchow who made pathology mean something more than postmortem observation; he it was who demonstrated that pathology, rightly considered, embodies all the cognate sciences in its effort to produce a true picture of morbid processes in life. Were it not for Virchow's championship of a broader conception of his subject, Ewing writes, the pathologist of today might still remain a mere servitor of the clinician, a dispenser of skilful diagnoses, a compendium of anatomic data.

Current Comment

OUR NEW POSTMASTER GENERAL

It is gratifying to physicians that a member of their profession is in the President's cabinet, even though he is there as Postmaster General, and not as the head of a national department of health. Dr. Hubert Work, the first physician to be thus honored since Dr. James McHenry served as Secretary of War in the cabinets of Washington and Adams, gained his present high position, not through political influence, but because his year as First Assistant Postmaster General proved him to be a man thoroughly qualified for the higher office. This was emphasized by the fact that his appointment was unanimously confirmed, without the usual reference to a committee, and within an hour after his nomination was received by the Senate. And this in spite of the fact that senators and representatives were bombarded with telegrams, letters and petitions from the antimedical faddists in general, and in particular from those to whom scientific medicine is anathema. During the war, Dr. Work was medical adviser of the Provost Marshal General, and in this position his diplomatic qualities were of inestimable service in correlating the work of the medical department of the army with that of the Provost Marshal General's Office. For several years he represented his state as a member of the Republican National Committee, a position of no small importance in our political system. Dr. Work always has been interested in the welfare of his profession, and it is said that he was the youngest man ever elected president of the Colorado State Medical Society. For four years he was president of the board of health of that state. He was the first Speaker of the House of Delegates of the American Medical Association, having been elected in 1916 as head of the body in which he had served continuously as a member since 1904 and being reelected each year until he was made President-Elect of the Association in 1920. He is now serving as President of the Association. Those who know Dr. Work realize that he possesses all of the fundamental qualities required for fulfilling his high position—courtesy, tact, honesty and justness.

FIGURES NEVER LIE—BUT FIGURERS DO

Those practitioners of the healing art who maintain that all pathologic conditions, from cancer to chilblains and from soft corns to hardening of the liver, are due to subluxated vertebrae impinging on spinal nerves are republishing their annual batch of "statistics" on the chiropractic treatment of influenza. The standard advertisement runs, in part, as follows:

> The Following Statistics of the 1918 "Flu" Epidemic are Respectfully Submitted:
> One of Every 16 Patients Died Under Medical Treatments.
> One of Every 127 Patients Died Under Osteopathic Treatments.
> One of Every 513 Patients Died Under Christian Science Treatments.
> One of Every 886 Patients Died Under Chiropractic Adjustments.

These figures, of course, are evolved from the inner consciousness of those gentlemen that furnish verbal ammunition for chiropractic advertising campaigns. But, even assuming them to be correct, just what do they prove? They prove that many more people die when under the care of a physician than die when under the care of an osteopath, a Christian science practitioner or a chiropractor. The medical profession is perfectly willing to admit this; it is equally willing to admit that the vast majority of those who die, die in bed. Neither of these somewhat self-evident propositions, however, argues that scientific medicine is more dangerous than chiropractic, "Christian science" or osteopathy, or that a bed is a dangerous place. They do prove that most people who are sick enough to be in danger of death are usually in bed and under the care of a physician. Any one who is familiar with the facts may admit that comparatively few people die while directly under "chiropractic adjustment" or any other of the fad "treatments." There are two outstanding reasons for this. The first is that the man who relies, for example, on chiropractic for the relief of some passing indisposition precipitately

deserts this cult when he realizes that he is dangerously ill. Then he calls in a physician; should he die, he dies under "orthodox medical treatment." The second reason is that, should a patient die under "chiropractic adjustment," the law would require an inquest, as in very few states in the Union are these gentry permitted to sign death certificates. It is notorious that when the "patient" of a chiropractor becomes dangerously ill, the chiropractor urges the family to call in a physician!

ENDOWMENT FOR HOPKINS SCHOOL OF HYGIENE

The magnificent gift of $6,000,000 by the Rockefeller Foundation to the Johns Hopkins University for endowment of its School of Hygiene, mentioned elsewhere in this issue of The Journal, represents a recognition by the foundation of the great strides that preventive medicine has made in the last decade. When the Hopkins school was opened in 1918, the Rockefeller Foundation consented to make annual contributions for a series of years, but the school had not an assured and definite income on which it could build for the future. Of the present gift, $1,000,000 is to be utilized for the construction of a building, plans for which have already been drawn, and the remaining $5,000,000 is to constitute a permanent endowment which is expected to yield an annual income of $250,000 for maintenance. Since its establishment, the School of Hygiene has exercised a great influence in advancing the cause of preventive medicine. At present, there are enrolled 131 students, who include representatives from twenty-seven states and ten foreign countries. Dr. William H. Welch, director, and Dr. William H. Howell, assistant director, have laid emphasis on the training of men and women competent to accept positions as health officials in communities of importance. In addition to outlining a regular course of study leading to the degrees of Doctor of Public Health, Doctor of Science in Hygiene, and Bachelor of Science in Hygiene, it is planned to give short courses or institutes for health workers already in service. It is interesting to learn also that the state of Maryland has encouraged the giving of such contributions as the Rockefeller Foundation has made to the Hopkins school by passing a law exempting such gifts from taxation.

OUR KNOWLEDGE OF VITAMINS

Commenting on the trend of medical research concerning vitamins, the latest report of the British Medical Research Council says:

> The present situation is a curious one, upon which posterity will probably look back with great interest. We still have almost no knowledge of the nature of these elusive food substances or of their mode of action, but we have gained empirical knowledge already of the greatest practical value for the prevention of scurvy and of other grave diseases and for the promotion of health and beauty in the population.

This statement, it will be noted, emphasizes the foundation on which rests our present use of vitamins. From time to time The Journal has commented on our lack of actual knowledge of these mysterious substances, emphasizing particularly the generally accepted fact that the taking of a well-balanced diet results in providing the individual with such vitamins as are necessary to his growth and nutrition. Last week appeared a brief report of a meeting of the Chicago Medical Society devoted to this subject, and it was gratifying to have the conservative view which The Journal has emphasized substantiated by many of those who took part in the discussion. Moreover, the *British Medical Journal*, in its leading editorial for February 11, reiterates that an abundant supply of vitamins exists in all fresh vegetables, and that a considerable quantity occurs in milk and meat, provided the latter substances are obtained from animals fed on fresh foods. "A normal adult," it says, "living on an ordinary diet containing a reasonable proportion of fresh vegetables is, therefore, certain of obtaining a plentiful supply of vitamins." Of all the mass of evidence which has accumulated relative to these substances, this fact is the point of greatest importance. It is, however, very unfortunately, the one point which those commercially inclined are unwilling to recognize.

LEGISLATION FOR PAY OF OFFICERS

Last week The Journal published the fundamental facts [1] regarding the proposed bill for the readjustment of pay of members of the Army, Navy, Public Health Service, Coast and Geodetic Survey, and Coast Guard. Unless some action is taken on this bill prior to July 1, 1922, officers of these services will automatically revert to the 1908 pay schedule, notwithstanding the fact that today the purchasing value of the dollar is greatly diminished. As will have been noted by a study of the material published, the new bill is based on the principles that:

1. Length of service should be a controlling factor in determining rates of pay.
2. There should be an element in the compensation of an officer that will increase or decrease the total compensation as the cost of living increases or decreases.
3. The conditions under which an officer lives are so dissimilar to those existing in civil life that some extra compensation should be allowed to enable him to care for his family under these conditions.
4. A junior officer requires somewhat less in the matter of living conditions than older officers.

In the general readjustment to be effected by this bill, an actual saving over the 1923 budget is assured. As our readers know, the physicians who take commissions in these government services virtually commit themselves to a life of renunciation so far as financial independence is concerned. It will, therefore, be no more than their due that the government give them a satisfactory living wage. The bill is sponsored by Senator James W. Wadsworth, New York, and Representative John C. McKenzie, Illinois. Physicians may aid the enactment of this legislation by writing directly to them, expressing approval of the proposed measure.

1. Government Services, J. A. M. A. **78**: 663 (March 4) 1922.

Association News

ST. LOUIS SESSION

Automobile Accommodations

The Local Committee of Arrangements with the cooperation of the St. Louis Convention, Publicity and Tourist Bureau has made arrangements so that Fellows who may wish to do so can use the Tourist Camp in Forest Park during their stay in St. Louis. This camp will accommodate approximately 150 automobiles. It is equipped with camp stoves, toilet facilities, shower baths, running water and sinks for washing articles of any kind, also with a temporary rest room. The camp is located in the western part of Forest Park just off Wells Drive, about a quarter of a mile east of Skinker Road. It is a pleasant shaded spot. Physicians who wish to camp out during their stay in St. Louis, should apply for permits, either directly to Mr. Fred W. Pape, Commissioner of Parks and Recreation, or to the Hotel Committee, Dr. Louis H. Behrens, Chairman, at 3525 Pine Street, St. Louis.

Hotel Accommodations

The Committee on Hotels announces that at all large hotels at St. Louis there are one or more large rooms with bath which will accommodate from four to six persons. These are desirable rooms, and when several persons are coming from the same community these groups can be consigned to one of the larger hotels if they will room together.

These accommodations can be secured when it would not be possible to quarter the physicians in the same hotel under other conditions.

Parties who desire to use such rooms should write direct to the chairman on the Committee on Hotels, Dr. Louis H. Behrens, 3535 Pine Street, St. Louis.

ANNUAL CONGRESS ON MEDICAL EDUCATION, LICENSURE, PUBLIC HEALTH AND HOSPITALS

Held in Chicago, March 6-10, 1922

MEDICAL EDUCATION

MONDAY, MARCH 6—MORNING

A Constructive Program

DR. ARTHUR DEAN BEVAN, Chicago: The right conception of medical education must recognize the fact that its ultimate object is to secure to every person the great benefits of modern scientific medicine. It would be a great mistake for the university to develop its medical school as a school of science without proper regard for the fact that the people and the medical profession of that community have an important and vital everyday interest in its organization and workings. For almost twenty years the American Medical Association has been making an intensive study of medical education through its Council on Medical Education.

What is the primary purpose of the medical school? I cannot do better in presenting this thought to you than to quote from a report made by President Henry S. Pritchett in the latest (1921) report of the Carnegie Foundation. He says: "The primary purpose of the medical school is to train practitioners for the medical profession. There are many by-products of this primary intention, but as Huxley so clearly pointed out a generation ago, these are by-products whether one considers the service of the school to the public health, to medical research or to any other related field of endeavor. All experience goes to prove that these by-products will be greatest when the medical school conceives most clearly its fundamental purpose and bends its effort most directly to it."

The last ten years have shown a notable advance in medical education. The result has come primarily from the leaders of the medical profession. Through them the American Medical Association and its Council on Medical Education have exerted a salutary influence to weed out the unfit medical school, to promote a sounder and more sincere medical education, and to raise the standard of medical practice. The epoch-making report written by Mr. Abraham Flexner ten years ago voiced in effective fashion the views of the wisest medical men in America.

The medical school should be located in and about the hospital and the dispensary because it is here that we can best have access to the patient who is the object of our study. The laboratories and class rooms used to teach the daughter sciences of anatomy and physiology, pathology and pharmacology should be grouped about the hospital and dispensary. The opposite point of view, that the sciences of anatomy and physiology, pharmacology and pathology together form the science of medicine and that medicine is simply the application of these sciences, and because of that fact that the medical school should be located at the university in touch with these departments, is not sound and should not be considered by university trustees in organizing and locating the medical department.

TEACHING HOSPITAL

The expense of conducting a hospital large enough for a teaching hospital for a medical school is great, and it should not be borne by the medical school. The primary function of a hospital is to care for the sick; its secondary functions are teaching and research. In serving its primary purpose it is doing an essential work in the community, and its cost should be properly borne by the community which it serves. In addition to the teaching hospital there should be an outpatient department which is essential in medical teaching and a diagnostic clinic, such a plant as the Mayo Clinic building, where the staff of the hospital can have its consultation and examining rooms, clinical laboratories and every facility to examine and care for pay outpatients. I believe that the time has come when we should recognize such a diagnostic clinic as one of the most essential plants in our medical school scheme. In addition to the general teaching, hospital affiliation should be made with special hospitals, as maternity, and children's orthopedic hospitals, for teaching purposes, and when possible, these should be built around the general medical center. The training school for nurses is an essential part of the hospital, and the teaching should be under the control of the medical staff. The trained nurse is an assistant to the physician, and it is the duty of the medical staff to see that she is properly trained. I emphasize this because it is a duty which is too often neglected.

TIME IN MEDICAL CURRICULUM

In constructing the medical curriculum, proper consideration must be given to the element of time. We should aim to bring students to the medical school at the average age of 20, and complete the medical course, including the intern year, at the average age of 25. This will require a saving of about two years, as the present average age at completion of the intern year is 27 plus. One outstanding fact that seems clear in the light of our studies of medical education and its relation to the American college course of four years is that the purposeless four year college course is an anomaly and a menace to national efficiency, and that it definitely should be done away with and its place taken by a specific preliminary two years' course preparatory for the professional schools, medicine, law, engineering, teaching, etc. The premedical requirement of physics, chemistry and biology is sound and is now generally accepted. The year spent by the student in the hospital should be a required part of his medical course. The intern year should be required by both the medical school and the state licensing board. I want again to urge the medical schools to make provision to train specialists and to provide postgraduate courses for medical practitioners. It is clearly their duty to do these two things and it is not an impossible or difficult task.

Problems Resulting from the Recent Improvements in Medical Education

DR. N. P. COLWELL, Chicago: The enlargement of the medical school, with its laboratories, its larger utilization of hospitals and its more complex curriculum is resulting

also in a revolution in the practice of the healing art. Indeed, several important problems have resulted largely from the modern training now obtained by medical graduates and the essentials for the practice of modern medicine. Some of these problems are stated as follows: (*a*) The cost of furnishing a medical education has been greatly increased; (*b*) medical schools are finding it necessary to limit the enrolment of students; (*c*) there is a rapid trend toward specialization in the practice of medicine; (*d*) there is an increasing development of group clinics; (*e*) there is a growing demand for hospitals, and the number is rapidly increasing; (*f*) there is an increasing demand for interns, and (*g*) there is an increasing shortage of physicians in the smaller towns and rural communities.

EXPENSE OF CONDUCTING MEDICAL SCHOOLS

Medical school expenses have been greatly increased; the larger buildings entail greater cost for lighting and heating and for janitor service; there is a larger number of expensively equipped laboratories; there is the larger expenditure required for medical research; there is a greater expense for the maintenance of libraries with their series of medical periodicals, and of medical museums including the cost for the preparation of new material and, unless provided by the city, state or private benefactors, there is the large expense for the maintenance of dispensaries and hospitals. The largest single item of cost, however, is for salaries paid to the essential expert instructors who devote their entire time to teaching and research. The carrying out of the modern curriculum also requires a larger expenditure for administration, for records and for clerical assistants. It is not surprising, therefore, that at present the cost of furnishing a medical education is nearly four times greater than the income obtained from students' fees, even though there has also been an increase in the tuition fees charged.

Reports obtained from sixty-nine medical schools in regard to income and expenditures for the last fiscal year show that the average income was $130,671.87, including $35,135.37 (26.8 per cent.) obtained from students' fees, and $95,536.50 from other sources. The average expenditure by each college was $125,041.46, including $46,161.60 (37 per cent.) for all-time teachers, $21,131.42 (17 per cent.) for part-time teachers, $19,679.46 for wages, and $38,068.98 for maintenance and supplies. Of these sixty-nine medical schools, the average yearly fee obtained from each student was $185.08, and the average amount which the medical school expended in order to furnish his instruction was $655.05. In 1916 the average fee paid by each student in eighty-two colleges reporting was just $150, and the average expenditure for each student was $419. In the five years, therefore, the average expenditure has increased 56 per cent., while the tuition fee has increased only 24 per cent.

LIMITATION OF STUDENTS

As the medical curriculum became more complex, and the teaching of students in small sections became more general, especially in dispensaries and hospitals, a larger number of individual teachers were required, and administration became more difficult. To prevent confusion and to establish greater efficiency, therefore, it became necessary for medical schools to admit only such students as their teachers, laboratory space, and available hospital and dispensary facilities would permit. Forty-seven medical schools are now limiting the number of students admitted to each class, this limit varying from twenty to forty students per class in the smaller, and from eighty to 170 students in the larger colleges. These forty-seven colleges with their limited enrolments have a total capacity for 11,925 students. The remaining nineteen Class A colleges have an estimated capacity, based on inspection, for 4,400 students. The sixty-six Class A medical schools now existing, therefore, have a total capacity for 15,925 students.

Sixteen of the Class A medical schools report that, by adding several teachers, making certain increases of laboratory space, or by other minor modifications, provision could be made for enrolling approximately 1,500 more students, which would increase the capacity of the sixty-six Class A schools to 17,425 students. This is about 1,500 more students than are now enrolled in all existing medical schools, including those in Classes A, B and C.

As entrance requirements were being raised, anxiety was expressed lest this would cause a dearth in the number of medical students and eventually a shortage of physicians. At present, however, the numbers of premedical students are so large that universities are wondering whether all can secure admission to medical schools. It was expected that a reduction in enrolments would follow the adoption of higher entrance requirements, and the total gradually decreased until in 1919 only 13,052 students were enrolled, or less than half of the number (28,142) enrolled in 1905, the time this country had more than half of the world's supply of medical schools. Since 1919, the total enrolment has increased by about 1,000 students each year, and during the present session approximately 15,967 students are enrolled, an increase of 1,095 since a year ago. The present number represents the largest enrolment of medical students since 1914. The great majority of these students are in the seventy-six (94 per cent.) medical schools requiring two or more years of college work for admission and which have also undergone many other improvements. In 1914, however, only 44 (43 per cent.) of the medical schools were requiring the higher entrance qualifications.

SPECIALIZATION

During the last twenty years, the number of physicians entering the specialties has been rapidly increasing, and the proportion remaining in general practice has been correspondingly decreasing. This is the result that naturally follows the enlargement of the field of medical knowledge, the greatly improved medical schools, the more complex medical curriculum, and the modern methods of medical instruction. The medical education given in the average medical school prior to 1900 could result only in the turning out of general practitioners. Physicians were not trained to become specialists until after several years of general practice, or after securing a considerable amount of postgraduate medical education. In that period, the medical curriculum did not include even the essential instruction in the specialties now properly given in medical schools. The fields of medical knowledge and of practice are now so wide that no one can secure the highest degree of efficiency and skill in the diagnosis and treatment of diseases unless he limits his practice within certain narrow lines, leaving diseases in other fields to other specialists.

It also appears that medical graduates, only too frequently, begin practicing some specialty immediately after finishing their intern year, without first obtaining as a foundation to such practice the valuable experience obtainable through five or more years of general practice. In the rapid development of the medical schools, therefore, their primary object should not be overlooked, namely, that of training physicians for the general practice of medicine. A revision of the medical curriculum with this object in view is an exceedingly important matter.

GROUP CLINICS

Another development resulting from the rapidly widening field of medical knowledge is the group clinic, the hospital staff, the partnership, or other scheme whereby several specialists cooperate in their practice, so that each will be free to do such work as comes within his specialty. Such groups, if properly conducted, may be of service to the patient, who goes to the clinic, pays one fee, and is examined and treated by specialists. At present, unless he is a charity patient and goes to a free dispensary, he is shunted from one specialist to another at a great loss of time, undergoes several examinations, and pays several large fees.

HOSPITALS

During the last fifteen years, the number of hospitals has been tremendously increased. In 1913, there were approximately 2,500 general hospitals having more than twenty-five beds, including 924 having a hundred beds or more and about 1,500 others having from twenty-five to 100 beds, the total capacity being approximately 200,000 beds. In 1920 the number of general hospitals increased to 4,012, having a total bed capacity of 307,358. The latter figure does not include about 2,000 other hospitals, such as government hospitals, sanatoriums for the insane, state sanatoriums for the tuberculous, penitentiary hospitals, or homes for the aged, blind, incurables, etc.

SUPPLY OF INTERNS

In recent years three factors have greatly increased the demand for interns. One is the improved qualifications of

the present day graduates in medicine as compared with fifteen or more years ago. In former years, many hospitals did not use interns and would not have them in the hospital. Ten years ago, in fact, there were not enough internships available for the 4,483 students who graduated in that year. With the improvement of the qualifications of medical graduates, however, more of these hospitals have made use of intern service.

The second factor in the increased demand for interns is the rapidly increasing number of hospitals. The supply did not fail to meet the demand until during the World War, when so many graduates who had planned to take hospital internships secured commissions in the government medical services. Beginning at that time, the demand for interns has become more and more pronounced. In 1918 there were 1,126 hospitals seeking interns. These hospitals had a total of 270,000 beds, providing internships for approximately 6,000 medical graduates, more than were turned out even in 1902. Hereafter, the training of interns may with advantage be restricted to the hospitals having the facilities and methods for providing a fifth year of actual medical instruction. Other hospitals will need to employ house physicians or to arrange otherwise for the services usually done by interns. A third factor in the demand for interns has been the improvements resulting from the campaign to improve hospital service, which has called for better records, including histories of patients, records of physical examinations, records of laboratory analyses, records showing the patients' progress, and end-results.

SHOTAGE OF PHYSICIANS

For this increasing shortage of physicians in such communities there are several reasons. Foremost is the economic reason that physicians can no longer make a living in such communities. The rapid progress in the prevention of disease has diminished the cases of sickness in rural districts as well as in cities. The development of the automobile, the improved roads and interurban car lines has added to the country practitioner's difficulties in that well-to-do people in the country are going more and more to physicians in the cities, leaving only the emergency and charity cases for the country doctor. No wonder the country doctor, after he left the government medical service, preferred to seek a location somewhere else. Another reason has been the revolution in the practice of medicine through the general recognition of the advantages of hospital practice in the diagnosis and treatment of human diseases. This also has induced many of the wealthy country patients to go to the city for treatment, to the detriment of the country doctor. A third reason is the general trend of population from rural districts to the cities.

The most certain method of insuring a supply of competent physicians for rural communities is to have a community hospital established in every center of population having people enough in the town and surrounding country to support it.

Report on Undergraduate Medical Curriculum: What Subjects, If Any, Should Be Transferred to the Graduate Medical School?

DR. RAY LYMAN WILBUR, Palo Alto, Calif.: The essential aim of the undergraduate medical curriculum is to provide clinical training to a student already versed in laboratory methods so that he will know how to practice medicine. The degree of Doctor of Medicine should mean that its recipient has a large fund of immediately available anatomic, physiologic and clinical information with which he can aid and guide a patient after his well trained sense organs have gathered together as many facts as possible, and his brain has given them an orderly relationship. The development of the power of observation and of rapid, honest, unbiased reasoning, based on ascertained facts, is the specific problem before the medical student. Watch a trained clinician enter the sickroom. He is as keen as a bird dog on the scent. Every sense is alert. His eye takes in at a glance the surroundings of the patient, the evidences of care or lack of care, anxiety, repose, cyanosis, jaundice and a hundred other conditions. His ear tells him of voice changes, types of breathing. His nose adds its share; and when he touches the patient or percusses the chest, a combination of all the senses helps him to build up a mental picture of the processes going on inside the human body which years of training have taught him to know so well. All the time his mind is busy arranging the facts ascertained, calling up former experiences, measuring values, reaching conclusions, mapping out plans for additional methods of seeking information and preparing a method of treatment. When well done, such a visit represents the height of ordinary human achievement, and at times it seems to bear the evidences of genius.

In the undergraduate medical years we are seeking to lay the basis for such work in medical practice. We can call it the art of medicine or the science of medicine. The two merge into one in real medical work, and a skilled technician must be the result. The main reason the present undergraduate course often fails is that we have tried to force into four short years the enormous and constantly growing fund of medical knowledge. I am reminded of the professor I heard lecture some years ago, who spent twenty minutes of a lecture hour in a general course in a carefully digested description of a very rare medical condition and who closed by saying, "Now I want you to remember this because when you get out into practice I want you to be able to say, no matter what kind of a case you may meet, that I covered it in my lectures."

WEAKNESSES OF FUNDAMENTAL TRAINING

The other great weakness of the present curriculum is that it was built up at a time when clinical teachers had no confidence in the basic training of the student, and they felt impelled to repeat fundamentals and reorient students in each so-called course. There are few medical schools even today in which the medical student is not taught the general phenomena of inflammation by from three to fifteen different teachers in different subjects. Repetition of elementary work, duplication and lack of coordination, too much informational material, rigid legal hour requirement, and the dead hand have made the present medical school a place where only those who can gorge can expect to come out well trained. In short, we have built up such a wonderfully intricate mechanism of hours, schedules, lectures, courses, that it has become scrambled, mixed up, unwieldy and inefficient. Why not scramble it entirely, look carefully over the mass, pick out the fundamentals and get a fresh start? Our students come to us now after a good preliminary training which has eliminated many of the unfit. They have a training in the basic sciences, and are able to do an increasing amount of independent and thoughtful work.

The fundamentals with which they must concern themselves are: (1) sound basic training in methods of thought, memory and honest reasoning; (2) the ability to observe; (3) the ability to use books and the tools of the profession; (4) the retention of a sound body with acute trained senses, and (5) the mental accumulation of essential facts immediately available for use.

The central core of medical training must include anatomy, physiology, chemistry, bacteriology, pathology, pharmacology, clinical and laboratory medicine, including pediatrics and mental diseases, clinical and laboratory surgery, obstetrics and gynecology, hygiene and public health. We can add for good trimming the history of medicine and medical jurisprudence. There is no need to include any of the so-called specialties except in an elementary way if the foregoing subjects are adequately taught. The professors of medicine and surgery can readily bring the main essential facts of every specialty into their routine teaching. The student can be left time enough for optional work in his four years so that he can enter any chosen special field for additional technical training. If he learns, though, how to examine thoroughly a single patient, he will have the principal tools and information required. The specialties, taught as they are at present, belong outside the undergraduate medical curriculum. They can be included in the medical curriculum when they are taught by men who can range over the body instead of having their vision limited largely to body orifices. Such men can come in and form part of the teaching staff of any one of the three great divisions of clinical medicine.

Without emphasizing any of the details, my ideas are: 1. Push some clinical work as far back into the medical course as is physically possible to heighten the interest of

the student and give him a sense of professional training. 2. Divide up the last two years between general medicine and pediatrics, including mental diseases, 40 per cent.; general surgery, 30 per cent.; obstetrics and gynecology, 10 per cent.; hygiene and public health, from 5 to 10 per cent.; optional work, such as special work along general lines, thesis, work in special fields, medical jurisprudence, history of medicine, etc., from 15 to 10 per cent. 3. Bring the laboratories into immediate conjunction with the clinics so that the eye of the student, still bearing the image of the anemic appearance of a patient, may see his red blood cells. 4. Have the clinician cross over freely into the domains now sacred to the specialists, bringing in the specialists to help him. 5. Have a committee on coordination of course content with regular reports of the ground covered by teachers to avoid duplication and to see that each class is exposed to a sufficient amount of well balanced and selected information. 6. Make hospital experience with responsibility a requirement for graduation either by the intern year or by some other device. One responsibility well met, no matter what the pathologic condition, is of more value in medical training than a dozen carefully dehydrated lectures. 7. Since all medical practice is of the nature of research and medicine is constantly growing, keep the spirit of research active all along the line in the medical course.

A New Curriculum: Report of Committee on Education and Pedagogics

Dr. Hugh Cabot, Ann Arbor, Mich.: Perhaps the most striking thing about the curriculum of American medical colleges is its increasing tendency to rigidity of requirement. This rigidity might be considered from two points of view: first, in its effect on the student, and second, its effect on the individual school.

RIGIDITY OF THE CURRICULUM

The increased requirement has now become so great that almost the entire time of the student from entrance to graduation is prescribed in allotted hours. This inevitably results in enforcing individual conformity both in the amount of knowledge acquired in the different fields and also in the rate at which that knowledge must be acquired. This might easily have a tendency to produce a relatively uniform product and would do so if it were not for the notorious variation in the capacity and acquisitiveness of the human mind. It probably has to some extent tended to produce a similarity of product which is not clearly desirable and has had a tendency to put a premium on steady plodding work rather than on individuality of approach to the subject and the development of the personality of the student. The present course hurries students along without time for contemplation; and, while it may perhaps be true that every human mind is not capable of contemplation, still it is hardly safe so to plan the teaching schedule as to make it relatively impossible. Again, it tends to discount the notoriously different rate at which men acquire knowledge and to make it difficult for a student whose mind moves slowly but surely toward its goal to keep the pace, resulting perhaps in hardship to men of high grade though not rapidly moving minds.

The curriculum, as it is at present, has a definite tendency to produce a great similarity between Class A schools; and, while a certain similarity in the general level of the course offered is not only desirable but also essential, it would be unfortunate if the curriculum should have the tendency to standardize medical education beyond a reasonable point. It appears to us that individuality in schools is no less desirable in individuals, and it is clearly true that the conditions surrounding any given school will, when allowed reasonably free play, result in a high degree of individual development. To a considerable extent, the best result will be obtained in any particular school or in any particular locality if a reasonable chance be allowed to build the curriculum around the particular group of men who are or may become available. Rigidity of curriculum tends to make it difficult for each school to build its departments in such a way as to allow the widest scope for the chiefs of departments and to encourage them to develop teaching methods and the relation between required and desirable knowledge which their particular circumstances would permit.

CONCENTRATION OF PRECLINICAL SUBJECTS

Perhaps one of the most striking changes coming more or less as a result of the standardizing of medical teaching was the concentration of preclinical subjects. At the time this was done it was regarded by many as a pretty bold experiment; but there can be no doubt that it has constituted a definite advance over previous conditions. It is perhaps more important that such an arrangement should be made in the teaching of American students, as the criticism that they have lacked basic training has clearly been more or less valid. That the concentration has improved to a great extent the basic training and tended to offset this criticism will be generally admitted. On the other hand, this plan has now had an extended trial, and it appears proper to inquire whether or not it has developed any weaknesses. The obvious danger of this plan, undoubtedly foreseen from the start, was that it would tend to segregate medicine in the mind of the student and that he would come to think of the fundamental branches as somewhat removed not only in time but also in application from the clinical work. It is desirable that the medical student should be associated with things medical at the earliest point in his course, since the time that can be devoted to the study of medicine is all too short to develop proper understanding of the human body in health and disease, and particularly to develop in the student the art of dealing with human beings. It is probably true that, in the days before the concentration of preclinical subjects, the student did in fact acquire more knowledge of the manifestations of disease, though he clearly lacked a foundation on which to base his knowledge.

In attempting to work out a new curriculum, your committee prepared a tabular view based primarily on the recommendations of the two previous reports and showing what would have been the result if the plan of assigning a definite number of hours to each subject had been adhered to. You will note by reference to the tabular view that no startling changes would have resulted except a large increase of the hours required for the teaching of hygiene and preventive medicine from a requirement of fifty-four hours to a requirement of 170 hours. This, we believe, is entirely consonant with the widely held opinion that the absolute requirement in these subjects has been too small and that while in some schools an excellent course has been given, in others it has fallen below what might be regarded as necessary and has yet complied with the previous recommendation. There can, we think, be no doubt that the importance of these subjects is now generally recognized, and they must, therefore, be given a much more prominent position in the absolute requirements. The other most striking increases would have been one of 100 hours in the combined field of pathology and bacteriology, the increase being about equally divided between the two basic subjects and some increase in general medicine and also in pediatrics. It will be noted that the net result of these increases, large and small, would have been to add to what may be regarded as an already overburdened curriculum a total of some 440 hours. Such an increase our committee would feel very reluctant to make, as we entirely believe that the present absolute requirements are very high, and we have grave doubts whether they can be increased with safety.

We have therefore decided to recommend to the Association that the method of stating the requirement in terms of hours for each subject be abandoned. For this we would substitute a plan which we believe will maintain the present high standard, but relieve the curriculum of its present rigidity and allow individual development. Assuming the present premedical requirements, and also assuming the present required medical course of four years of eight months each, we would state the requirement in each subject in terms of percentages and not in hours. Thus:

Better	Per cent.
Anatomy	14 to 18.5
Physiology	4.5 to 6
Biochemistry	3.5 to 4
Bacteriology and pathology	10 to 13
Pharmacology	4 to 5
Medicine	20 to 26.5
Preventive medicine and hygiene	3 to 4
Surgery	13 to 17.5
Obstetrics and gynecology	4 to 5
	76 to 100
Electives up to 25 per cent.	

It will be noted that a variation of about 25 per cent. is allowed, and also that in the broad fields of medicine and surgery no specific allotment is made for the subdivision of specialties. Thus, each school may work out its own schedule with a very free hand and present electives or not as it thinks best.

DISCUSSION

DR. WILLIAM DARRACH, New York: Our chairman (Dr. Bevan) painted a beautiful picture of the organization of the medical school, the hospital, and the clinical head of the departments, who is going to satisfy the demands made on him by the prominent clinician, to satisfy most of the demands made by the general public on him and to solve their problems, and also to run the hospital service in a way that it should be run and also to do the teaching. It is the kind of supermen we see in Chicago, but we do not find them in New York. Our experience is that the clinical teacher, who is trying to satisfy all the demands made on him, is very busy.

I can find nothing to disagree with in Dr. Wilbur's paper. He has opened up possibilities that are sound and sane for the future, and I am sure that the curriculum of the medical schools of the country five years from now will be much more liberal; that it is going to be one which will allow students to have that freedom of working out their own individuality which Dr. Cabot has emphasized without becoming mere receptacles of knowledge that is pumped into them. Nothing is more impossible than the present curriculum. As long as we limit teachers to the courses they are giving to undergraduate students, we shall find it impossible to prevent them from teaching those details in which they are most interested. If we provide some means or opportunity for teaching optional courses both to undergraduates and to graduates and university students, they will be more willing to confine their efforts to the fundamental lines of the undergraduate work than if we make that their only opportunity for teaching. For that reason, I believe that the best and most efficient methods of building up teaching work in the medical sciences lies in association with the undergraduate course, the undergraduate work, and all the other more special and more advanced courses, whether that is teaching for graduates in a general sense, or in a more restricted sense of public health work, university work, dental work, teaching nurses, and all the other branches which all come under the same group.

DR. E. P. LYON, Minneapolis: I have always been in harmony with the idea that the curriculum should be freed as much as possible of the rigidity mentioned by Dr. Cabot. We have enough elements of rigidity in the very nature of things, because we must get certain things in the course. The course must be based on anatomy, physiology, pathology and so forth, and we cannot go outside of these widely. Our Minnesota program at present is founded on the theory that a certain amount of elective work should be given as far as possible throughout the course.

DR. DAVID L. EDSALL, Boston: In regard to the fixation of the schedule, some of the things we have done are in consonance with the statements made by Dr. Wilbur. We have reduced the time of minor specialties down to a point at which they seem to contribute more to a knowledge of general medicine and general surgery, and not give a man the opportunity to feel that he knows anything about the practice of specialties, which are limited to thirty-six hours each in the third year. In the fourth year we have applied the whole time of one month to pediatrics, one month to additional obstetrics, and the remainder to general medicine and surgery and elective work, two months being free for a man to select what he sees fit.

Regarding the duplication of subjects referred to by Dr. Wilbur, that has been one of our greatest faults. It is a difficult thing to overcome, but by having combined exercises, namely, a certain amount of medicine and surgery, a considerable amount of pediatrics and medicine, giving it once instead of twice, we have gradually been increasing the amount of exercises given together. Let us take gastrointestinal conditions, such as gastric and duodenal ulcer. The medical man, surgeon and pathologist teach it together at one time. Or let us take cardiac irregularities. The physiologist will teach this subject in relation to cardiac irregularities along with the pathologist and clinician. By a slow process of attempting to eliminate as much as we can a repetition of things, we guard against confusion in the mind of the student because these subjects are presented differently by different men.

DR. ALEXANDER PRIMROSE, Toronto: Instead of having what you call a four year medical course we have dovetailed that in with a two year premedical course and call it a six year medical course. This has helped us in some respects to solve some of the problems just discussed. In addition to the former ordinary entrance examinations to the university which admitted students of medicine, we have required an extra year preceding the course in medicine, requiring a student to take up certain subjects in which he has to pass an examination—English, mathematics, Latin or one modern language. In the six years' course we have introduced methods of option, and that has helped us to a considerable degree in meeting the defects regarding the standardization of students. It is an attempt to meet the problem that has been raised of putting all students through exactly the same mill, and not giving an opportunity for the development of the individual.

DR. H. GIDEON WELLS, Chicago: In making changes in the curriculum, one fundamental principle that should always be considered is that the medical student is a student throughout his life. He puts in under the present curriculum two years on the fundamental branches, and then when he graduates he has his whole life to improve his clinical knowledge. He has for the first few years to get the fundamentals on which his clinical knowledge must be built. Difficulties arose in previous years from the crowded curriculum, and lack of opportunity for original work and for initiative. Since we have introduced the quarterly system we have given a man an opportunity to elect what he wishes. He can make up his deficiencies brought about by illness or by the necessity of having to earn a living. We have been deeply impressed with the value of the quarterly system in many particulars.

DR. C. R. BARDEEN, Madison, Wis.: With reference to cutting down the clinical branches into two years, I think that what Dr. Wells said is correct, and yet I am inclined to think that the way the premedical courses are taught at present, we have too many grammarians teaching premedical courses—anatomy, physiology or other branches to the student—so that when the student gets into clinical medicine he finds his grammar too complex to use and gets along with a sort of stuttering language or a broken language the rest of his life, instead of having simply grammatical principles so that when he talks medicine, he talks it fairly logically.

DR. ALEXANDER C. ABBOTT, Philadelphia: There is need of more elasticity in the medical course. The medical student must be made to realize the relationship of the underlying sciences to the solution of clinical problems, from the time he enters a medical school. I can see no reason why sick patients should not be shown to the first year medical student as they are shown to the third year medical student, because unless premedical instruction in biology is made practical, the student who has not had instruction in general biology cannot appreciate what is going on in the animal body when he sees it. A competent teacher of the underlying sciences in the medical course can and should directly point out the relationship of the underlying sciences to "what is the matter with the patient," and in doing that it would be possible for the two subjects to be made infinitely more interesting than they are at present.

DR. NATHANIEL ALLISON, St. Louis: We have for the last two years been endeavoring to have a curriculum which gives the student more chances for initiative and to encourage him to develop resourcefulness. We are proposing to have a required course called a coordinated course. Unfortunately, we have not very well decided on how to give this course; but the idea is that the preclinical man should give certain things in medicine, and the medical man should give certain things in physiology, and so on, interchanging. This would be a required course throughout the four years, indicating to the sudent the value of some of the things he sees in the laboratory and in the clinic from the standpoint of correlation.

DR. C. A. HAMANN, Cleveland: We have reached the conclusion at the Western Reserve University that more elasticity in the curriculum is necessary. More opportunity

should be given for initiative, and in the last year particularly electives should be allowed. We should give opportunity in the form of electives to those men who wish to pursue laboratory branches. Needless to say, there is a dearth of laboratory men, and if a student in his second, third or fourth year manifests a disposition to go into laboratory branches, I think he should be afforded an opportunity in the choice of electives to do that.

DR. WALTER L. BIERRING, Des Moines, Iowa: A broader development of clinical teaching is largely based on the development of the medical sciences in this country and their closer affiliation with the clinical department. It is unfortunate, indeed, that there is a distinct line of division between the first two and the last two years, and it is gratifying to note that this is occupying the thought of the educator and that an effort is being made to bring these years closer together; yet there is a tendency in the discussion to attribute rather to the clinical heads the power of teaching medical physiology, pathology and the other fundamental branches when, in reality, all investigative work in the clinical departments should be in charge of the heads of the fundamental branches. Unless something is done to make the teaching of the fundamental sciences more attractive, to bring about closer affiliation, there will be a defect in the general training of the medical graduate, and in a short time the teacher of the fundamental sciences will only be a matter of history.

DR. CHARLES P. EMERSON, Indianapolis: I am fully convinced that if medical education is to develop progressively, and if we are to consider the curriculum with a view to future generations and the problems before us, we must hand over to them a better curriculum than that which we are planning now.

DR. LOUIS B. WILSON, Rochester, Minn.: From the standpoint of the graduate school, we of the University of Minnesota can thoroughly confirm the suspicions that things are not all right with the graduates that are being turned out from the undergraduate schools. They lack individuality. They come to us in a most receptive attitude, with very little initiative. They come to us with a tremendous burden of useless knowledge. They come to us knowing a lot of things that are not true, knowing few things that are worth while, and, above all, most uninteresting men. They lack culture, they know neither art nor literature; they know little of music, and certainly nothing of history and nothing of language. All these things they ought to have as gentlemen and as citizens in an intelligent community.

DR. FRANK BILLINGS, Chicago: The curriculum of the medical school needs modification chiefly because teachers are specialists in every branch, and because of that fact each branch is taught separately and distinctly and is usually unrelated to any other subject in the curriculum. In consequence, our students are unable in many instances to fit the bricks, so to speak, into the general structure of their education. It is a mistake that we have separated the fundamentals of medicine from the clinical branches, so that there is no real coordination of the branches, and there is no mixing of the faculty so that members may rub against one another and have a broad understanding of the work of each.

REV. C. B. MOULINIER, Milwaukee: The limitation of a curriculum in any kind of teaching in the whole field of human education must be based on the amount of knowledge and the intensity with which that knowledge is grasped by the mind; and if the medical profession continues to grow as it has been growing in the last few years as a teaching body, you are going to have medical textbooks for the undergraduate which permit me to call the bachelor's degree, and another set of textbooks which I call the master's degree. If it ever becomes possible for the medical profession to grade education, according to the intensity of knowledge, as the master, bachelor and doctor of knowledge, you will have covered the whole field as most of the other pedagogic fields are covered today.

MR. WALLACE BUTTERICK, President of the General Education Board, New York: In connection with this discussion I would like to quote the late Viscount Bryce as saying that standardization is the curse of education. Rigidity is a much more felicitous word than standardization, for standardization connotes the thought of thoroughness of a curriculum that makes for the development of intellectual power. As teachers we are set to teach men and women to train their minds, to have the quality of moral earnestness and capacity for sustained education, so that they in turn may address themselves to the great problems not only in the medical profession but in all callings of life.

(To be continued)

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Medical Building for University.—A contract has been let for a new medical building at the University of Alabama, Tuscaloosa, at a cost of $82,000. Construction work will be started immediately.

CALIFORNIA

Personal.—Dr. Alfred James Scott, Jr., Los Angeles, has been appointed a member of the state board of health to succeed the late Dr. Albert Lindley.

Hospital News.—Two adjoining tracts have recently been purchased by the Good Samaritan Hospital board, Los Angeles, for the erection of an additional building. The hospital will now cover an entire block.

Physicians Lose Licenses.—It has been announced by the secretary of the state board of medical examiners that the board has revoked the medical license of Dr. Jacob L. Arbogast, Sacramento, following his conviction for violation of the Harrison Narcotic Law. Dr. Arbogast was fined $300. Five other physicians also had their licenses revoked, including Dr. Lawrence Bartlett, San Francisco.

History of Medicine.—The council of the Medical Society of the State of California announces that it is interested in securing histories of the organizers of medicine by counties throughout the state. Any physician who wishes to handle this matter for his own county is requested to communicate with the state secretary. Dr. Charles D. Ball, Santa Ana, is writing a history of the pioneers of Orange County.

DISTRICT OF COLUMBIA

Clinic of Applied Immunology.—The Woman's Welfare Association, Washington, has established a clinic of applied immunology for working women and girls, in an effort to create better womanhood. Preventive inoculations will be given for smallpox, typhoid fever and diphtheria to those who desire them, at fees ranging from 25 to 50 cents. In the new clinic, the treatment of asthma, hay-fever and eczema will receive special consideration.

Health Journal Suspends Publication. — It has been announced by the League of Red Cross Societies that the *International Journal of Public Health*, which started July, 1920, and was printed in several languages, entailing a considerable expense, will be suspended. The league has decided to concentrate its efforts and resources on the promotion of popular health instruction through the American Red Cross. The *International Journal of Public Health* may be resumed later, through the financial assistance of international organizations.

GEORGIA

Hospital News.—It is reported that the contracts have been awarded for the construction of seven government hospital buildings at Augusta, at a cost of $283,000.

ILLINOIS

Chicago

Banquet for Dr. Robertson.—A testimonial dinner was given, February 6, in honor of Dr. John Dill Robertson, former city health commissioner. More than 1,000 city health department employees, it is reported, attended the banquet. Mayor Thompson in speaking of Dr. Robertson's work said that he had reduced the death rate in Chicago from 15 to 11

per thousand during his term of office. Dr. William A. Evans was the toastmaster.

Venereal Disease Conference.—According to an announcement of the state department of public health, the venereal disease conference will be held in Chicago, March 13-18, under the auspices of the U. S. Public Health Service, the Illinois State Department of Health, the Chicago Department of Health and the Illinois Social Hygiene League. Dr. Hugh Neil MacKechnie, president of the Chicago Medical Society; Walter Dill Scott, Ph.D., president of Northwestern University, Chicago; Dr. Herman Neils Bundesen, health commissioner of Chicago, Dr. Charles Edward Humiston, president of the Illinois State Medical Society, and Dr. Isaac Donaldson Rawlings, director of the state department of health, Springfield, will give addresses at the meeting.

INDIANA

Hospital News.—Plans have been made for the establishment of a hospital for incurable patients who are now in the Indianapolis City Hospital, as more room is needed for patients who can be restored to normal health.

Lectures on Biochemistry and Experimental Medicine.—A course of eight lectures on current problems of biochemistry and experimental medicine is being given at the Indiana University School of Medicine, Indianapolis. This course started February 15, and will be given on alternate Wednesday evenings at the university, under the direction of Prof. B. Bernard Turner, Ph.D.

Woman's Council on Social Hygiene.—A permanent organization of the council was effected, February 24, with the assistance of Drs. William F. King and James G. Royse of the state board of health. A representative of the Indiana Federation of Colored Women's Clubs will have charge of the work of the council among the colored women of the state.

Personal.—Dr. A. E. Rhyan has been appointed health officer of Parke County.——Dr. Crouch has been made county physician for Putnam County.——Dr. Ernest M. Conrad has been appointed health officer of Anderson, to succeed Dr. James A. Long.——Drs. Harry W. Fitzpatrick, Carrol C. Cotton and William H. Hoppenrath, Elwood, have been made members of the city board of health.——Dr. Louis A. Bolling, Attica, has accepted a position with the Veterans' Bureau, Washington, D. C.——Dr. George T. MacCoy, Columbus, has been elected president of the Indiana Tuberculosis Association.

KENTUCKY

Personal.—Dr. Fred Anderson Jones has been appointed city physician of Paducah, to succeed Dr. Edward Adams.

Protest Bill Affecting Institutions.—Twelve members of the medical advisory board of the state board of charities and corrections have written to the Senate Committee on Penal and Charitable Institutions, protesting against the passage of Senate Bill 38, which defines the qualifications of members of the board, superintendents of the state institutions and employees. One of the qualifications is that the institution superintendent and employees must be residents of Kentucky, which, the medical board states, "would greatly augment the heavy handicaps already imposed on the board, as men trained in the care of the mentally deficient, the feebleminded and the delinquent are difficult to secure in any state."

LOUISIANA

Hospital News.—The contract has been let for the building of the Shriners' hospital for crippled children at Shreveport, at a cost of $144,000. The institution will be ready for occupancy, Oct. 1, 1922.

MARYLAND

Hospital News.—It has been announced that the Biedler-Sellman Hospital, Baltimore, has been purchased by Dr. Ira L. Fetterhoff, who will operate it under the name of the Homewood Hospital.

Herter Foundation Lectures.—The fourteenth course of lectures on this foundation was given at the Johns Hopkins Hospital, Baltimore, March 7-9, by Dr. William Maddox Bayliss, professor of physiology and dean of the faculty of science, University College, London, England.

Coroners Appointed.—The following physicians have been appointed coroners by Governor Ritchie, for two years, from the first Monday in May, 1922: Drs. J. Tyrrell Hennessy, Harry K. Gorsuch, Otto M. Reinhardt, Thomas B. Horton, James M. Fenton, John J. Morrissey, William T. Riley, J. Knox Insley, and George C. Blades.

Clinic for Children Who Work.—A clinic, designed to bring children who are forced to earn their own living up to a higher standard of health and physical development, has been established by a group of women members of the First Unitarian Church, Baltimore. This is the first move of the kind ever made in the state and it is being encouraged by members of the state board of labor and statistics, to which children must apply for permits to work. Dr. Lawson Wilkins, of the Johns Hopkins Hospital, has already held a preliminary clinic at the parish house, and clinics will be held there every Friday morning.

Donations to the Johns Hopkins University.—The Johns Hopkins University has been given $6,000,000 by the Rockefeller Foundation for the school of hygiene and public health. Of this amount, $1,000,000 will be available for the erection of new buildings for the school and $5,000,000 for an endowment covering its maintenance. The gift announced is said to be the largest ever made to any institution by any foundation. Work on the main building, the plans for which already have been drawn, is expected to start this summer. It will be located on a site which has already been acquired at the southeast corner of Monument and Wolfe streets and is so designed as to admit of liberal expansion. According to the provisions stipulated by the foundation, the annual contributions which the foundation has made to the school since it was opened in 1918 will be discontinued, and the trustees will assume full responsibility for the future needs of the school. A unique feature which the university authorities have planned in connection with the expansion of the school of hygiene is the eventual establishment, in the vicinity of the Johns Hopkins Hospital, of a "model" community, to be administered from the standpoint of public health and hygiene, on principles developed by the school as a result of its research studies. With the cooperation of the city and the residents, it is expected to include within the jurisdiction of this colony approximately 60,000 people. Such a colony has been established on a smaller scale by the school of hygiene at Hagerstown. Another gift to the Johns Hopkins Hospital is that of $3,000,000, by an anonymous donor, on condition that the university raise an additional $1,000,000. The offer was made last year and was referred to in the annual report. It was brought to the attention of the public with the announcement of the gift from the Rockefeller Foundation. Plans are being made for the expenditure of the gift and for the raising of the additional $1,000,000 that is necessary before the gift becomes available. The university will shortly announce its plan for securing the money.

MASSACHUSETTS

Personal.—Dr. George B. Magrath, Boston, has been renominated medical examiner for Suffolk County.——Dr. Benjamin Whitney Gleason, who recently resigned as member of the Athol board of health, has been appointed to the veterans' liability department, Boston.

Harvard Board of Overseers.—The nominating committee of the Harvard Alumni Association has selected Dr. William Sidney Thayer, Baltimore, former president of the Association of American Physicians, and Dr. Herbert Charles Moffitt, San Francisco, professor of medicine, University of California, as candidates for the Harvard board of overseers.

MICHIGAN

Tuberculosis Colony.—A new colony for tuberculous patients will be located at Grand Haven, for which a company has been capitalized at $75,000. Twenty cottages, so arranged that they will be open to the fresh air, will be in the colony, and a portion of the land will be cultivated for garden purposes so that all the vegetables used at the health haven will be grown on the property. Goat's milk will be used exclusively.

MISSISSIPPI

Hospital News.—The Coahuma County Antituberculosis Society will purchase a portable cottage to be loaned to tuberculosis patients.——A new charity hospital will be erected at Meridian at a cost of $100,000.

Vaccination Mandate.—According to a recent report, the Mississippi Board of Health has ordered that all persons visiting the carnival at Mobile, Ala., must be vaccinated, on account of the epidemic of smallpox at Mobile.

NEW HAMPSHIRE

Medical Profession Honors Members.—A banquet was given, February 17, at the Nashua Country Club on the occasion of the seventy-fifth birthday of Dr. Alonzo S. Wallace, and to honor two other deans of the profession, Dr. Isaiah G. Anthoine, aged 76, and Dr. Alfonse W. Petit, 69. Postprandial exercises were the feature of the evening, and Dr. John M. Gile, professor of surgery, Dartmouth Medical School, Hanover, and Dr. Charles S. Walker, Keene, and Dr. Dennis E. Sullivan, Concord, president and secretary, respectively, of the New Hampshire Medical Society, were among the visiting physicians who were present.

NEW YORK

Child Welfare Bill.—The state child welfare commission introduced a measure in the legislature, March 2, designed to include male children between the ages of 16 and 18 within the present law, which forbids the employment of females of that age in a factory for more than forty-eight hours a week or more than eight hours a day, and between the hours of 9 p. m. and 7 a. m.

Personal—Dr. Raymond F. Kircher has been appointed district physician of Albany, to fill the vacancy caused by the death of Dr. Eddy S. Haswell.——Dr. Walter W. Palmer, Bard professor of the practice of medicine, Columbia University, New York City, has been elected a member of the administrative board of the Institute of Cancer Research, to serve until June 30, 1924.——Dr. Reuben Wilson Shelley, Newfane, has been appointed superintendent of the Niagara County Sanatorium, to succeed Dr. Walter E. Deuel.

Lecture Course for Physicians.—A series of twelve practical lectures, illustrated with lantern slides, will be given under the auspices of the Medical Society of the County of Kings, Brooklyn. This is an attempt to give busy practitioners, who are unable to devote the time necessary to enroll in a college, a short graduate course in medicine, covering the most interesting and most essential subjects. The first lecture was given, March 3, by Dr. John Osborn Polak, professor of obstetrics and gynecology, Long Island College Hospital, on the subject "Pelvic Inflammation in Women"; Dr. William Francis Campbell, chief surgeon, Trinity Hospital, Brooklyn, spoke on "Infection of the Hand," March 10. Dr. George D. Stewart, professor of surgery, Bellevue Hospital Medical College, New York City, will deliver the third lecture, on "The Interpretation of Abdominal Pain," March 17; March 24, Dr. Glentworth R. Butler, Brooklyn Hospital, will speak on "Cardiac Murmurs and Arrythmias"; Dr. Roger H. Dennett, professor of pediatrics at the New York Post-Graduate Medical School, will deliver an address on "Infant Feeding," March 31. The second series will commence in October.

New York City

The New Hospital for Joint Diseases.—Plans have been filed for the new home of the Hospital for Joint Diseases, which is to occupy the block front on the east side of Madison Avenue, between One Hundred and Twenty-Third and One Hundred and Twenty-Fourth streets. There will be two buildings, a seven-story hospital, the estimated cost of which is $650,000, and a six-story service building, costing $250,000.

NORTH CAROLINA

Hospital News.—An addition will be erected at St. Peter's Hospital, Charlotte, at a cost of $60,000, to contain operating rooms, maternity wards, nurses' homes and all modern equipment. The erection of this addition was made possible through contributions of J. H. Cutter and W. A. Erwin of $50,000, and $10,0000 collected miscellaneously.——The contract has been awarded for the erection of the Baptist State Hospital, Winston-Salem, at a cost of $133,690. Construction work will be started at once and the building will be completed within a year.

OHIO

Physician Convicted.—It is reported that Dr. W. H. Black, aged 89, a veteran of the Civil War, has been sentenced to serve from one to seven years in the Ohio penitentiary, following his conviction on a charge of having performed an illegal operation, December 10, resulting in death.

Endowment Fund for Medical School.—The campaign for $216,000, for the endowment fund of the University of Cincinnati College of Medicine, to insure a gift of $7,000,000 from the Rockefeller Foundation and $2,000,000 from the Carnegie Foundation, contingent upon raising this sum, was brought to a close, February 14, with a total of $224,196.

OKLAHOMA

Hospital News.—A modern tuberculosis hospital has recently been opened at Talihina.

State Medical Meeting.—The annual meeting of the Oklahoma State Medical Association will be held at Oklahoma City, May 9-11, instead of May 16-18, as previously announced.

PENNSYLVANIA

Physician Acquitted.—Judge Woodring directed the jury to return a verdict of not guilty in the case of Dr. Samuel Irvin Darnell, Easton, who was charged with committing an illegal operation.

Personal.—Dr. George A. Stock, Gettysburg, has been appointed assistant superintendent of the New Jersey State Sanatorium, Glen Gardner, N. J.——Dr. Ray McKelvey Alexander, Bolivar, has been appointed medical examiner of the Royal Arcanum in the state of Pennsylvania, to succeed the late Dr. William Wesley Wolfe, Pittsburgh.——Drs. George Burton Stull, Carson Coover and Arthur Leban Page, Harrisburg, have been appointed Pennsylvania Railroad surgeons.

Social Welfare Conference.—The annual Pennsylvania state social welfare conference was held, in February, at York. It was attended by social workers of the state engaged in philanthropic and charitable work. Dr. John M. Baldy, commissioner of public welfare of Pennsylvania, presented the plan and the scope of work for the newly organized department of public welfare. Dr. William C. Sandy, New York City, chief of the bureau of mental health, state department of public welfare; Dr. Victor V. Anderson, New York City; Dr. Ellen C. Potter, Harrisburg, director of the bureau of children, state department of public welfare; Dr. Mary R. Noble, Harrisburg, chief of the division of child health, state department of health, and Dr. Joseph H. Hart, Dudley, director of school social work for the state, gave addresses.

Philadelphia

Personal.—Col. Alexander N. Stark, Medical Corps, U. S. Army, chief surgeon, third corps area, delivered the second of the series of lectures under the direction of the Seventy-Ninth Division, March 2, at the armory of the Philadelphia city troop.

Dinner in Honor of Dr. de Schweinitz.—The Philadelphia County Medical Society will give a dinner to the President-Elect of the American Medical Association, Dr. George Edmund de Schweinitz, at the Bellevue-Stratford Hotel, Tuesday evening, April 4.

SOUTH CAROLINA

Personal.—Capt. Charles V. Akin, since 1918 officer in charge of the bureau for the control of venereal diseases in South Carolina, has been assigned to Jacksonville, Fla., to conduct field surveys in connection with the child hygiene investigations.

Bill to Eliminate State Examination.—It is reported that a bill was introduced in the House of Representatives, February 2, by Charles T. Smith, Jr., Richland, advocating that graduates of the South Carolina Medical College be permitted to practice their profession in that state without examination by the state board of medical examiners and be admitted to practice medicine on recommendation of the college faculty. Under this law, the medical graduates will be on the same basis as the graduates of the law department of the University of South Carolina.

State Medical Meeting.—At the annual meeting of the South Carolina Medical Association to be held at Rock Hill, April 18-20, under the presidency of Dr. Harry L. Shaw, Sumter, the following provisional program has been announced: Dr. Frank Billings, Chicago, will deliver the address on medicine; Dr. Thomas S. Cullen, Baltimore, will deliver the address on surgery; Dr. Marion R. Nobley, major, M. C., U. S. Army, will read a paper on "Some Anatomical Considerations of the Mastoid Process of the Temporal Bone"; Dr. William F. R. Phillips, professor of anatomy at the Medical College of the State of South Carolina, Charleston, and of the Baylor University College of Medicine, Dallas, Texas, will deliver an address; Dr. Charles J. Lenmon,

Sumter, will speak on "The Diagnosis and Treatment of Toxic Goiters," and Dr. George H. Bunch will read a paper on "Acute Osteomyelitis in Children."

TEXAS

Hospital News.—The new hospital being erected by the International and Great Northern Hospital Association, Palestine, at a cost of $150,000, is nearly completed.

Joint Medical Meeting.—The medical associations of Austin, Burleson, Fayette, Grimes, Waller and Washington counties held a joint meeting at Brenham recently. Dr. Gustave L. Kusch, president of the Washington County Medical Association, presided at the meeting. A subdistrict association was formed and meetings will be held semiannually, the next to occur in August, at Navasota.

Personal.—Dr. Houston Neeley, Beeville, has been elected president of the Southwest Texas District Medical Society.——Dr. Sterling Price Boothe, Cuero, has been appointed county health officer, to succeed Dr. Joseph R. Frobese.——Dr. George B. Cornick, San Angelo, recently gave up his practice and sailed to Russia, where he will do relief work, among the starving inhabitants, under the direction of the American Relief Administration.

WASHINGTON

The Seattle Surgical Society.—At the annual meeting of the society held recently, under the presidency of Dr. Walter E. Kelton, the following officers were elected for 1922: Dr. John Hunt, president; Dr. Charlton Edward Hagyard, vice president, and Dr. Hubbard Thomas Buckner, secretary-treasurer. Dr. Henry Suzzallo gave an address on "The Surgical Society as an Education Force in the Community."

Puget Sound Academy of Ophthalmology and Otolaryngology.—At the annual meeting of the academy held recently, the following officers were elected for the ensuing year: president, Dr. Frederick W. Adams, Seattle; first vice president, Dr. Daniel Hughes Bell, Tacoma; second vice president, Dr. William G. Cameron, Tacoma, and secretary-treasurer, Dr. John Howard Harter, Seattle.

WISCONSIN

Physician Sentenced.—It is reported that Dr. Emil C. Schoene, Milwaukee, has been sentenced to a four-year term in the state prison on a charge of second degree manslaughter.

Personal.—Dr. Halley A. Smith, Antioch, Ill., has been appointed assistant physician at the Wisconsin State Home for Feeble Minded, Chippewa Falls.——Dr. William J. McKillip has been appointed permanent superintendent of the bureau of venereal diseases of the health department, Milwaukee.

Hospital News.—At the annual meeting of the Deaconess Hospital staff, Milwaukee, Dr. George H. Fellman was elected president, Dr. Murdock F. MacRae, vice president, and Dr. Robert W. Blumenthal, secretary-treasurer.——The new addition to St. Mary's Hospital, Wausau, is practically completed and will be opened to the public early in the spring. This brings the value of the institution to approximately $400,000.——The new hospital at Beaver Dam was opened early in February. Dedication services were held, January 29, under the direction of the local deaconess association.

CANADA

Personal.—Dr. George A. B. Hall, chief medical referee of the Workmen's Compensation Board for the last five years, has resigned and will resume private practice.

Committee of Mental Hygiene.—The annual meeting of the Canadian National Committee of Mental Hygiene was held, February 17, in Montreal. Lady Byng and Sir Arthur Currie delivered addresses at the meeting.

Ontario Academy of Medicine.—At a special meeting of the academy, February 23, Dr. Frederick H. Baetjer, associate professor of roentgenology, Johns Hopkins University Medical Depatment, Baltimore, delivered an address on "Radiology of Diseases of Bone."

Medical Meeting.—At the annual meeting of the North-Western Manitoba Medical Association, held recently, the following officers were elected for the ensuing year: president, Dr. George Clingan, Virden, and secretary-treasurer, Dr. Murough C. O'Brien, Rossburn.

GENERAL

Association of American Medical Colleges.—At the annual meeting held in Chicago, March 7, the following officers were elected: president, Dr. Charles P. Emerson, Indianapolis, University of Indiana; vice president, Dr. Irving S. Cutter, Omaha, University of Nebraska; secretary-treasurer, Dr. Fred. C. Zapffe, Chicago. The next annual meeting will be held at Ann Arbor, Mich., in 1923, at such time as may be decided by the executive council of the association.

Southern Public Health Laboratory Association.—The annual conference will be held, March 17-18, at Jackson, Miss., under the chairmanship of Dr. Clarence Albert Shore, Raleigh, N. C. The membership of this association is limited to directors of state, municipal and county health laboratories, but all who are interested in health laboratory work are invited to attend. Discussions will pertain to laboratory technic and to the standardization of containers and report forms.

Donations by the Rockefeller Foundation.—Following the decision of John D. Rockefeller to permit the general education board to distribute the principal as well as the income from its funds to colleges, the sum of $600,000 has been given to the Northwestern University Medical School, Evanston, Ill., toward the $2,000,000 fund now being raised; the Illinois Wesleyan University, Bloomington, Ill., received $135,000 toward a $400,000 fund; Lincoln School, New York City, received $153,100 for a new building and equipment, and $184,475 was given for negro education. Donations totaling $1,811,666 were also distributed.

Roentgen-Ray Laboratories Regulated.—At a meeting of the New York Board of Health, January 26, a resolution was adopted that Article 7 of the Sanitary Code be amended by adding thereto a new section, to read as follows: Section 107. No person shall maintain, operate or conduct a roentgen-ray laboratory or advertise or hold out to the public that a roentgen-ray laboratory is maintained, operated or conducted, wherein radiographs are taken, diagnoses made or human beings examined or treated by roentgen rays, without a permit therefor issued by the board of health, or otherwise than in accordance with the terms of said permit and with the regulations of the said board.

Bequests and Donations.—The following bequests and donations have recently been announced:

American Society for the Control of Cancer, $50,000, as a memorial to Harry M. Lasker, New York City, by his family.

Tacoma General Hospital, Wash., $40,000, by the will of Jane C. Bradley.

Columbia University, New York City, her residuary estate, in addition to a direct bequest of $30,000 for chemical research, by the will of Cora M. Perkins.

St. Peter's Hospital, Charlotte, N. C., $30,000, for an addition to the institution, by J. H. Cutter; $20,000 to be used for a memorial to his grandson, by Dr. Erwin, Durham.

The Eldora Hospital, Iowa, $10,000, from J. E. Booth, in memory of his wife; the name of the hospital to be changed to the Eldora Booth Memorial Hospital.

Mount Sinai Hospital, New York City, $150,000; the Hebrew Orphan Asylum, the Sanatorium for Poor Children and the Lenox Hill Hospital, $5,000 each, by the will of Alfred S. Heidelbach.

The North American Sanatorium for Children, Atlantic City, N. J., $1,250; Home of the Merciful Saviour for Crippled Children, $1,000, by the will of Mary C. Ihling, Philadelphia.

The Neversink Mountain Tuberculosis Sanatorium, Reading, Pa., $960, by the commissioners of Berks County.

The Episcopal Hospital and the Pennsylvania Hospital, Philadelphia, $100 each, by the will of Catherine C. Wentz.

Cheerfield Farm, Shelby County, Tenn., $500, from the result of a prize contest.

Schenck Memorial Hospital, Seymour, Ind., a home for nurses, as a memorial to her husband, by Mrs. Louise Schenck.

LATIN AMERICA

New Officers of a Medical Society.—The medical society of Caracas, Venezuela, recently elected the following officers: president, Dr. B. Perdomo Hurtado; vice president, Dr. V. Peña; secretary, Dr. E. González; treasurer, Dr. J. Sanabria Bruzual; librarian, Dr. Luis Rivero, and editor of the journal, Dr. D. Luciani.

Personal.—Dr. J. F. Medina of Mexico City has sailed for Europe, after spending several months in this country visiting hospitals in Chicago and eastern states.——Dr. A. Herrera Vegas of Caracas is now in Spain.——Dr. J. R. Risquez, a professor of the medical school of Caracas, has returned to his country after taking graduate courses in Paris and Berlin.

The Sixth Latin-American Medical Congress.—The *Revista de Medicina y Cirugía* of Havana brings the details of the organization of the next Latin-American Medical Congress which is to convene at Havana, Nov. 20 to 25, 1922. The

appeal is signed by Dr. Juan Guiteras as president of the committee of organization, and Dr. F. M. Fernández, Prado 105, Havana, as secretary.

FOREIGN

The Markham Skerritt Prize.—The University of Bristol, England, has awarded the Markham Skerritt Prize to Sir J. Herbert Parsons, F.R.C.S.

Fellowship for Woman Physician.—Dr. Nellie Wall-Mesham of South Africa has been granted an international fellowship in bacteriology at Liverpool University, England.

Medical Publisher Awarded Honorary Degree.—One of the partners of the J. Springer medical publishing house at Berlin, F. Springer, has had an honorary medical degree conferred on him by the medical faculty of Frankfort on the Main.

Italian Congress for Industrial and Agricultural Hygiene.—The fifth national congress of this kind is to convene at Florence, June 11 to 14, 1922. The six subjects appointed for discussion are hygiene of the workers in malarial districts; new and old views on lead poisoning; shifts in work; legislation on workmen's compensation; new horizons in medicosocial ethics, and prevention of medical disability.

International Neurologic Reunion.—Our Paris exchanges state that the Third Annual International Neurologic Reunion is to meet at the Salpêtrière at Paris, June 2 and 3, 1922, mornings and afternoons. The subject appointed for study is the symptoms from pituitary insufficiency. Roussy and Camus of Paris will discuss it from the standpoint of anatomy and pathologic physiology, and Froment of Lyons from the clinical and therapeutic standpoint.

Abortionists in the Courts.—In the *landgericht* at Munich recently a group of eighty-one women and girls were accused of criminal abortion, and twenty-two were condemned to prison for from six to eight months; thirty-two were condemned for from six weeks to three months as although they had tried to commit abortion they had failed; twenty were acquitted. The *Münchener medizinische Wochenschrift* adds that the medical abortionist is to be tried by a jury.

The National Medical Association of China.—The annual conference of the association was held, January 21 to February 4, in Shanghai, under the presidency of Dr. C. Voonping Yui, Shanghai. Dr. Hata; Dr. Shiga, director of the government medical school, Seoul; Dr. Edward Hume of the Hunan-Yale College of Medicine, Changsha, and Prof. Harold Balme, F.R.C.S., dean of the Shantung Christian University School of Medicine, Tsinanfu, author of "China and Modern Medicine," were among visiting physicians who attended the session. Dr. E. S. Tyau, Shanghai, and Dr. Shchuan, Peking, are vice presidents; Dr. W. S. New, Shanghai, is the English secretary-treasurer, and Dr. E. P. Hsieh, Peking, is the Chinese secretary of the association.

The Social Hygiene Dispensary at Bordeaux.—THE JOURNAL mentioned last spring the laying of the cornerstone of the antituberculosis dispensary presented by the Rockefeller Foundation to the Protestant Hospital at Bordeaux. The dispensary is now completed, and the *Journal de Médecine de Bordeaux* gives illustrations of the institution and describes its scope and the ceremony of its inauguration. It is at Bagatelle, at the city limits. The regular program includes hygiene of the respiratory passages, Tuesday and Friday afternoons; hygiene of infants, Wednesday afternoon; hygiene of the pregnant, Friday afternoon, and roentgen rays, Tuesday and Friday mornings. The new training school for nurses, the American memorial to the nurses who lost their lives in the war, is well along in its construction.

Reciprocity in Degrees with Italy.—There has been considerable agitation in Italy recently in regard to accepting credentials as to medical degrees from countries which do not accept Italian degrees. At the Congresso Federale degli Ordini, held at Rome in 1920, it was voted not to accept the credentials even when the degree had been conferred by an Italian university, if the candidate's country did not accept Italian degrees. In spite of these protests, the Italian government has recently registered Dr. E. Renold of Porto Maurizio, close to the French border, and the *Riforma Medica* states that the organized physicians in that district, forming the "Medical Order," have appealed to the profession at large to have nothing to do with this Dr. Renold, and have appealed to the pharmacists to refuse to dispense his prescriptions. At the same time, the *Rivista della Stampa Medica* announces an official communication from the Soviet government of Russia agreeing to accept reciprocity with Italy. It is signed by Samascko, commissioner of public health.

Deaths in Other Countries

Dr. **G. C. Bright,** last surviving son of Dr. Richard Bright, at Cannes, France, January 21, aged 81.——Dr. **T. F. Pedley,** January 13, at Rangoon, Burma.——Dr. **Lovel Moss,** ophthalmologist, Algeciras, died in a hospital at Gibraltar, January 24, from injuries received when the car in which he was driving was struck by a troop train.——Dr. **D. Gorokhoff,** professor of surgery and gynecology, University of Moscow, from epidemic encephalitis.——Dr. **Vincenzo Guilffrida-Ruggeri,** professor of anthropology, University of Naples, December 21.——Dr. **W. H. Robinson,** major general, Indian Medical Service, sanitary commissioner for the government of Bengal, in Calcutta, aged 58.——Dr. **F. Pecirka,** professor of skin and venereal diseases at the University of Prague, vice president of the national public health service, aged 63.——Dr. **V. E. Núñez** of Buenos Aires, lieutenant-colonel in the medical service of the army, and director of the *parque sanitorio.*——Dr. **M. Perrin** of Avenches, Switzerland.——Dr. **C. Secretan-Mayor,** the dean of the profession in Switzerland, aged 87.——Dr. **J. de Giacomi,** instructor at Berne, known by his stain for certain bacteria.——From Haiti comes the notice of the deaths of Dr. **A. Mucci** and of Dr. **J. Fleury,** the latter medical officer of the port of Port-au-Prince.——Dr. **E. Chappet,** dean of the profession at Lyons, aged 97.——Dr. **G. Ernest,** physician to the Association des Journalistes Parisiens.——Dr. **E. Rivière of Paris.**——Dr. **S. Khoury,** medical officer of the Suez Canal Company.

Government Services

Watson-Dyer Bill Approved by Secretary Mellon

The Watson-Dyer bill, giving a permanent status to reserve officers of the U. S. Public Health Service, has attained additional advancement as a result of its approval by Secretary of the Treasury A. W. Mellon. In a formal letter to Senator McCumber, chairman of the Senate Committee on Finance, before which the bill is pending, Secretary Mellon thus endorsed the measure:

> The uncertainty of the tenure of office among the reserve medical officers tends to create an unrest among them and detracts from the efficiency of their services. This uncertainty prevents foresighted doctors from providing for prudential consideration of their future and those who are able to find opportunities in private practice will leave the Service. Furthermore, it is reasonable to suppose that such opportunities of leaving the Service will come most frequently to the most skilled and efficient.
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> In my opinion some legislation should be enacted to provide for permanent tenure of office for a limited number of these medical men. In view of the fact that such physicians will necessarily have to be subject to change of station and financial hardships of temporary residence and the inability to engage in private practice, I know of no better way than to authorize the transfer to the regular commissioned corps of a limited number of these officers along the lines proposed in the bill under discussion.
>
> I am mindful of the fact that the government desires to furnish to the disabled man and woman the very best medical service. It is an obligation of the government which is now being met by approximately 1,000 medical men, who are themselves veterans of the World War. I am, therefore, also mindful of the fact that the government has some obligation to the medical veterans now in the Public Health Service. This obligation of the government will be provided for in the bill which you have submitted.

Secretary Mellon suggests a modification of the bill so that, instead of 550 reserve officers being transferred to the permanent corps, the number will be reduced to 350. Thereafter, should additional doctors be required, further legislation may be enacted. In concluding his endorsement of the measure, Secretary Mellon points out that it will not require any increase in appropriations of government funds. The bill has already been endorsed by Director Forbes of the Veterans' Bureau and by the American Legion in its annual convention at St. Louis.

Second Deficiency Bill

A second deficiency bill for the present fiscal year has been presented to the House of Representatives by the Appropriations Committee. The measure carries an appropriation of $93,993,112 additional for the U. S. Veterans' Bureau, divided thus: $73,714,182 for vocational training of ex-service men and $20,278,930 for medical and hospital supplies. This makes a total for the U. S. Veterans' Bureau for the year of $178,714,182 for vocational training, and of $78,278,930 for medical and hospital services.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Feb. 13, 1922.

School Clinics

A special course of instruction for school medical officers and physicians desiring to undertake the work of school clinics on a part time basis has been inaugurated at the London Hospital. Sir George Newman, principal medical officer of the ministry of health, delivered an opening address. The course, he said, presented rare opportunities and was of peculiar interest. One of the difficulties experienced in the school medical service was in drawing the attention of the whole and part time school medical officers and assistants to the fact that, fundamentally, the service must rest on a clinical basis, if it was to be a success. He emphasized this fact, because it was difficult to retain the clinical spirit when a man became an administrator. He was anxious that physicians throughout the country should understand a little more fully what the school medical service was and what it involved. Without universal military service, we could not get particulars of the physical condition of adults, but we now had got hold of the children by means of the school medical service. That service has grown until now some 2,250,000 children are medically inspected every year, receiving treatment when necessary. It has been found that it is not practicable for private physicians to treat complaints of the eye, teeth, ear, nose and throat (including removal of adenoids) and the skin, and various minor ailments. The government has been compelled to take up these branches of medical work among schoolchildren and to provide for them either in hospitals or in school clinics. Disease in the child was of great importance. If the State could solve the problem of the child's health, it could solve the problem of the national health, because, fundamentally, it was in the child that we had the opportunity to prevent disease in the nation. If the problem was not dealt with, we should never pick up the lost threads. If it were dealt with, we should turn off the tap of a great deal of disease. In childhood, not only could disease be prevented but how to avoid disease could be taught also. Infant mortality was perhaps the most sensitive index of the health of a nation; in fact, it was more sensitive than the death rate. Love of personal hygiene is a vastly greater preventive of disease than the various external forms of sanitation. Nine hundred school clinics have been established throughout the country. He could not conceive a more valuable preparation for students and for physicians than the course which was about to be started.

White Lead Poisoning in New South Wales

The Board of Trade of New South Wales has issued a voluminous report on an inquiry into the question whether white lead is so injurious to painters that its use should be regulated or prohibited. The board states that white lead is usually a basic carbonate of lead, though a basic sulphate is sometimes used. The poisonous qualities of a lead compound are determined, first by the size of the particles and consequently by the ease with which they can be disseminated through the air, and second, by their solubility in the body fluids. Lead carbonate and lead sulphate produce toxic symptoms when given in quantities of 0.1 gm. per kilogram of body weight per day. The chief cause of lead poisoning is dust or vapor. Inhalation of lead dust is more dangerous than ingestion. In the case of painters, there is no danger from lead vapor, since the vapor pressure of lead salts at room temperature is practically nil. Lead may be ingested in industrial conditions, but it is rendered insoluble in the stomach and the greater part is passed out in the feces. The lead dust enters the lungs and in due course is absorbed by the phagocytic cells without producing fibrosis. It is carried by the blood and deposited thereby in the tissues. It is eventually excreted by the bowel and to a slight extent, by the kidneys. Evidence given by Professor Chapman and Dr. S. A. Smith showed that lead remains stored in the tissues for a long time. They found it postmortem in the lungs of miners who worked at Broken Hill and had died from other causes. Under the conditions in the painting industry, absorption through the skin is negligible. Some important evidence was given by the technical commission of inquiry at Broken Hill, showing how slowly toxic symptoms develop in men exposed to lead dust. The following table is illustrative:

Length of Exposure to Lead	Number of Men	Showing Symptoms of Lead Poisoning Per Cent.	Not Showing Symptoms Per Cent.
Under 10 years	741	9.3	31.7
10 to 20 years	544	12.5	87.5
20 to 30 years	289	33.0	67.0
Over 30 years	123	26.0	74.0

In England, Dr. Legge, chief inspector of factories under the Home Office, showed that lead dust produced in the process of rubbing down painted surfaces before a fresh coat is applied is responsible for the dust which causes poisoning in painters and that exhaust ventilation is the proper mode of combating the danger from lead dust. Among the miners at Broken Hill, lead poisoning has been found in 9 per cent. of those exposed to dust containing lead sulphid and oxid. A trial of the regulations in force in Great Britain for the avoidance or removal of dust or spray containing lead is recommended. If they fail, prohibition must be introduced.

A Diploma in Tuberculosis

The Welsh National School of Medicine has established the first diploma in tuberculosis in this country. The diploma is in connection with the tuberculosis chair recently founded at the school by Major David Davies, M. P., and now occupied by Prof. Lyle Cummins. The new diploma will be a guarantee that its possessor has devoted a certain amount of time to the special study of tuberculosis and has passed a standard examination. Physicians with five years' experience as whole time workers at tuberculosis may present themselves for the examination without further courses of study. This should stimulate them to extend their reading beyond their immediate work. It is also hoped that the initiative of the University of Wales may be followed by other universities. If this occurs, it may be anticipated that, in a few years, only possessors of the diploma will have any chance in competing for a tuberculosis appointment. This would definitely raise the standard of tuberculosis work in the country.

PARIS

(From Our Regular Correspondent)

Feb. 10, 1922.

Professor Moureu's Impressions of the United States

One of our most learned chemists, Monsieur Charles Moureu, professor in the Collège de France and well known for his researches on the chemistry of rare gases, who, during the war, devoted all his time and energy to supplying the Frency army and the armies of the allies with new asphyxiating gases, has recently been spending some time in the United States, where he went as technical expert to the Commission des gaz asphyxiants. It was interesting to us to learn what impressions he received during his sojourn. Monsieur Moureu states that the chemical industry of the

United States has undergone a tremendous development of late, and that, inside of ten years, it will surpass the German industry. Dyes and rare gases are, he says, made the subject of careful study in the magnificent laboratories found in the universities and in the large American manufacturing plants. At Harvard University, Monsieur Moureu attended one of the meetings of the university professors which take place every week at which they discuss their researches, show what they are working out and invite the criticism of their colleagues. He found this a very ingenious method of conducting researches and one which seemed to promise excellent results. Moureu expressed his admiration for the University of Columbia in New York City.

Death Resulting from Painting a Tonsil with Tincture of Iodin

Dr. Mounier recently published in the *Journal de médecine de Paris* the report of a case which gives further evidence of the possible harmful effects of inconsiderate applications of tincture of iodin, especially if it is old. Dr. Mounier was called by a confrère in consultation in regard to one of his woman patients who, while suffering from sore throat, had painted the left tonsil extensively with tincture of iodin. Three days afterward, an examination of the throat revealed a mass of gangrenous tissue covering the whole left tonsillar region and a portion of the veil of the palate. In front and on the velum, the gangrene was confined to the surface, but the posterior pillar was sloughing off in shreds. The lesions were very deep at this point, and with the laryngoscope an edema of the left lateral portion of the epiglottis was noted. Under the influence of local treatment the condition seemed to improve somewhat during the first twenty-four hours, but the day following the temperature rose suddenly to 39.5 C. (103.1 F.). The local condition appeared better in that the lesions had not gained in extent or depth, but all the ulcerated surface was covered with a thick white coat which suggested diphtheria. An antidiphtheritic serum was injected immediately, and, as the gravity of the case was recognized, it was decided to transfer the patient to a hospital, where she could be given better care. The following morning, while the preliminary preparations were being made for her removal to the hospital, the patient suddenly died without giving any evidence of respiratory difficulty. As a necropsy was not performed, it is difficult to speak positively in regard to the immediate cause of death, which seemed to be due to an embolism or to toxic phenomena. From statements made by the patient and the family, it seems that the tincture of iodin was not fresh and that the tincture had been applied twice. This unfortunate woman, who was in the thirties, had never been seriously ill in her life and seemed to be in perfect health up to the onset of the sore throat which caused her to use the iodin.

Paying Patients in the Hospitals of Paris

At a recent meeting of the Syndicat médical de Paris, Dr. A. Lapointe read a report on the admission of patients who were possessed of means to the various establishments of the Assistance publique de Paris. He mentioned, in this connection, two changes that have been introduced by the administration of the Assistance publique. The first consists in applying the Breton tariff, which regulates the medical fees chargeable in the roentgenographic laboratories of the hospitals for the treatment of patients suffering from industrial accidents, to all patients whom the administration considers to be sufficiently supplied with funds as not to be entitled to receive gratuitous service. As far as the roentgenographic laboratories, at least, are concerned, the administration has decided to make a charge for medical attendance and thus erect a sort of barrier to prevent the improper use of these laboratories by patients with means. The second innovation is, unfortunately, far from being as satisfactory to the medical profession. The director of the Assistance publique has issued instructions to the superintendents of hospitals to establish a strict control in the consultation services with a view to exacting the regular fees from persons who are able to pay (the schedule is fixed at 4 francs). As Lapointe points out, the profession does not understand why a medical procedure which is charged for when it is performed by a roentgenologist is rated at zero when it is performed by a physician or surgeon. It is held by many that this innovation, far from driving away patients who have means, will rather attract them, for why should they refuse to take advantage of hospital consultations that are open, without restriction, to any one who will pay a registration fee of 4 francs? The direct outcome has been that the Syndicat médical de Paris has issued a protest against the decision which accords to patients of means free access to hospital consultations by merely paying to the administration a nominal registration fee without any further charges for medical attendance.

The syndicate holds that, in principle, the hospitals of the Assistance publique should be reserved for patients who are without funds. Regretting that this principle is not plainly written into the law and taking account of the difficulties that its strict application might engender, the syndicate considers one of the best ways of solving the problem is to exact not only a registration fee from patients with means but to make a charge for medical attendance as well. It is thought that this method will materially reduce the number of patients soliciting medical attendance in the hospitals of the Assistance publique when they in reality have sufficient means to secure treatment elsewhere.

Death of Dr. E. Rivière

Dr. Emile Rivière of Précourt, founder and president of the Société préhistorique de France, died recently in Paris, aged 87. After studying medicine and spending a few years in the field of medical journalism, Emile Rivière devoted his whole life to paleontology and prehistory. His numerous works on these subjects, more particularly the excavations that he undertook in the grottoes of Menton, where he brought to light several fossil human skeletons which are now preserved in the Museum of Natural History in Paris, and also his explorations in the caverns of the Central Plateau, procured for him a worthy reputation in the scientific world.

A Rare Complication of Malaria

Dr. Braquehaye of Tunis has recently called attention, in the *Revue tunisienne des sciences médicales*, to a rare complication of malaria that he had an opportunity of observing, during the war, in the Serbian soldiers that were hospitalized in one of the hospitals of Tunis. When admitted, the patients presented paroxysms of mammary congestion. At every attack, at the moment of the onset of the fever, the mammary gland enlarged and became painful, sometimes on one side and sometimes on both sides. Clinically, the symptoms recalled those of mammitis in adolescents. The patients were, furthermore, young men, aged from 20 to 25. Under the influence of injections of quinin and moist compressive dressings applied to the mamma, the congestion retrogressed rapidly. Braquehaye has been unable to find in the treatises devoted to malaria any reference to such symptoms.

Opening of the Ecole du Val-de-Grâce to Civilians

The minister of war has announced that, from now on, physicians, pharmacists and civilian students will be permitted to pursue courses of study and to take advantage of the resources of the museum and the library of the school of application of the military sanitary service of the Ecole du Val-de-Grâce.

MADRID

(From Our Regular Correspondent)

Jan. 30, 1922.

German Professors in Spain

Two roentgenologists, Chaould of Munich, and Warnekros of Berlin, accompanying the physicist Freidrich, have come to Spain at the invitation of Professor Otero, a gynecologist of Granada, who has organized in his institute a course in theoretical and practical roentgenography. The first lectures were delivered by Dr. Recasens, professor of gynecology and dean of the Madrid Medical School. When the course was over at Granada, these professors gave lectures in Madrid. Professor Friedrich defined the different elements involved in roentgenotherapy, explained the roentgen spectrum, its analogy to the light spectrum, and how he, together with Knipping, had demonstrated the correctness of Lauer's theory, as to the diffraction of the several rays of the roentgenographic spectrum, which enabled him later to discover the third electron in the atom of lithium. He explained his substitution of lineal squares to demonstrate solar diffraction for prisms made from several crystal salts; as, for instance, sodium chlorid, the atoms of which have a structure which modifies roentgen-ray radiations and makes visible, on the one hand, the complexity of these radiations and, on the other, the arrangement of the atomic elements. Professor Chaould devoted a session to the exhibition of several roentgenograms of the duodenum, with the patient in a recumbent position. The portion photographed lay half way between the ventral and the right lateral decubitus, pressure being exerted on the abdomen to create a temporal occlusion of the distal portion of the duodenum or proximal portion of the jejunum. This permits a good view of the duodenum and shows the typical nests of cancers, diverticula, stenoses, etc. Professor Chaould's second conference was devoted to an exhibition of a device in which the patient who is to be roentgenographed is placed. It is a box lined with a very thick coat of paraffin. This coat is for the purpose of generating secondary rays to compensate those lost on the way to the patient because of the distance of the ampule. This device saves time in centering on the focus a definite quantity of radiation. Professor Warnekros presented, in his first lecture, a beautiful collection of roentgenograms of pregnant women. They show most admirably the fetus and permit following of the actions of the forces acting on it during labor. They demonstrate that in normal presentations the fetal position is the best adapted to preserve physiologic normality. The head is not dislocated, nor the spinal column pressed down. Everything is prearranged so as to save the baby trouble. In all other positions, it is otherwise: in all of them the fetus suffers. In his second lecture, Professor Warnekros commented on the results obtained with roentgen-ray treatment of cervical cancer of the uterus as practiced by him in Bumm's clinic in Berlin. He stated that his greatest success had been secured by combining radical surgery with preventive roentgen-ray and radium treatment.

Sauerbruch Lectures on Cineplastics

Professor Sauerbruch of Munich has given several lectures in Madrid, two of them at the medical school. In his first lecture, he exhibited an artificial hand of his own designing, which is a mechanical wonder, inserted in two tunnels made in the biceps and triceps muscles. Crippled individuals, after some training, succeed in controlling the hand and make all kinds of motions, as Sauerbruch actually demonstrated in a former soldier. This man, who had lost both hands, moved the artificial hand in a most wonderful way, picking coins from the ground, rolling cigarets, writing, etc. Sauerbruch's trip, precisely at the time when the Moroccan campaign was claiming many victims, has brought hope and relief to several crippled soldiers. In another lecture, Sauerbruch dealt with the results of lung surgery.

Voronoff Lectures in the Madrid Medical School

Dr. Voronoff, of the physiologic station of the College of France, has given, in the Madrid Medical School, a lecture on organ transplantation. As available material, Dr. Voronoff recommended: (1) organs of persons dying through accidents, since there is a difference of several hours between the death of the individual as a whole and that of tissues and organs; (2) organs furnished voluntarily; as regards thyroid transplantation, donors usually are mothers; in the case of testicular grafts, they might be obtained from patients with cryptorchidism; (3) material taken directly from anthropoid apes, such as the gorilla, chimpanzee and orangutan. Organs removed from apes and grafted by Voronoff in man have "taken" and performed several functions with better results than those of human origin. This is perhaps due to the fact that the organs of the former are younger and perhaps stronger. Voronoff has had such success that he is urging the creation of farms devoted to the growth of anthropoid apes. These animals could render great service, since the analogy of their plasma with that of man permits its use in many ways in human medicine.

PRAGUE

(From Our Regular Correspondent)

Feb. 1, 1922.

National Council on Social Hygiene

January 21, a meeting of the National Council on Social Hygiene took place in Prague. The council was formed a year ago on the initiative of Miss Alice G. Masaryk, the president of the Czechoslovak Red Cross, and of Prof. Selskar M. Gunn of the Rockefeller Foundation. The council represents a federation of eight of the most prominent private health and social agencies. The ministries of health and social welfare are represented in the council in an advisory capacity. The efforts of the last year have been spent largely on matters of study and organization. The council deals only with such things as have been delegated to it by the participating organizations. The question of the training of the health personnel was referred to the council last year and, through a committee, a revised schedule for a school already existing in Prague was worked out. Since the organization of the council, it has been felt that it must serve as a new channel for providing finances to the organizations which are members. The creation of the republic was followed by the speedy development and foundation of new private associations. The state, through its subsidies, was largely instrumental in their creation. Therefore, the associations grew more rapidly than their natural resources allowed. When the wave of economy swept the state, it became more difficult to get assistance from the government, and the private associations had to look to themselves to provide the necessary money. The result has been a great number of public drives, and every opportunity has been used for collecting money. It was quite natural that the public should resent this, and finally the associations became dissatisfied because the output of the collections grew smaller and smaller as the collections and drives became more numerous. At the meeting referred to above, it was decided that next year only two nation-wide drives would be held, and that the income from the drives would be divided on the basis of the expenditures of the different organizations for the previous year. In addition, the council will ask the government to grant for its purposes the receipts of a state lottery and to issue stamps and postcards for its benefit. For the purposes of better mutual information, a quarterly bulletin will be issued, in

which the activities, proposals, etc., of the organizations will be summarized. Whereas 1921 brought about the coordination of the central organizations, it is now planned to extend the idea of cordination into the field, during 1922. A special committee for the coordination of child welfare work is being considered. It is generally admitted that the creation of the National Council of Social Hygiene, which term in Czechoslovakia has a much broader meaning than in America, has been one of the strongest contributions toward the development of health activities in the country during the last year.

Public Health Nursing

There is a great need of public health nurses in Czechoslovakia. The steadily increasing number of tuberculosis dispensaries and child welfare stations is causing a more and more urgent demand. At the present time, there is no center for the training of such workers in the country. The state school for nurses in Prague, which is now under the direction of Miss Parson of the American Red Cross, was reorganized two years ago, but has facilities and courses for the training of bedside nurses only. On the initiative of a group of influential sociologists, a school of social work was created in Prague late in 1918. The graduates of this school have had considerable difficulty in finding places for which their training has fitted them. It was only natural that they accepted positions in dispensaries when there were no positions as public health nurses open. Experience showed, of course, that their education was insufficient to prepare them for public health work. This state of affairs caused the directors of the school for social work to reorganize it so that both public health nurses and social workers could be trained in the same school. The reorganization has been carried out, but the results are not satisfactory. The prominent health workers feel that the pupils are getting very little practical experience for their future task and think that a combination of a school for public health nurses with a school for bedside nurses is more desirable than a combination with a school for social workers. On the other hand, it would be advantageous if a school combining the training of a public health nurse and that of a social worker could be established. This would be particularly desirable for smaller communities, especially those which cannot afford to pay two school personnels. There is a tendency on the part of health workers toward the creation of a new school for public health nurses in close connection with a school for bedside nurses. This will probably not be established in Prague, so it will not interfere with the development of the Prague school of social service.

BERLIN

(From Our Regular Correspondent)

Feb. 4, 1922.

Departure of the American Quaker Mission

After having spent two years in Germany, during which time they have done a great deal of good, the Quakers have now taken their departure. Some of them are returning to America and some intend to go to Russia, where they will create a new organization for the aid of starving Russian children. During their two-year sojourn in Germany, the Quakers have distributed 350 million meals to German children and mothers. Whereas in the beginning only 10,000 meals per day were distributed, the relief work of the Quakers has grown until now about 600,000 meals are being served daily. In Berlin alone, 37,000 meals are given, in the suburbs about 40,000 meals, and if the system continues in vogue until July of this year it is thought that, on an average, 500,000 children and 50,000 mothers will be thus aided. Though the Quakers are leaving the country, the work that they established is to be continued in very much the same form. The administration of affairs will be placed in the hands of the executive committee for foreign assistance, and the meals will continue to be served in the various cities and districts through the aid of the schools and with the cooperation of the teachers and various public welfare societies. The food distribution was made possible by the foundation established two years ago by Herbert Hoover and it has been kept up by constant subscriptions. The German-Americans have now taken over the work and have founded the so-called three million dollar fund and have guaranteed that the children will continue to be given this supplementary feeding until July, at least. The name of this foundation has, for German ears, a somewhat startling sound when one stops to consider the value of the dollar in German money. But it must be remembered that 500,000 meals per day are to be served; that the foodstuffs, cocoa, lard, flour and sugar, are all brought from America and that the children pay nothing whatever for the meals. The small sum of 25 pfennigs (lately increased to 60 pfennigs), which is paid by children whose parents are able to pay something, is used only to cover the cost of the local administration; but the expense of the food and all transportation costs are borne by the fund. In the cases of some children the increase in weight has amounted to 22 pounds (10 kg.). The selection of the children is made without reference to social position, religion or the financial condition of the parents.

STATISTICS ON THE CAUSES OF DEATH FOR THE STATE OF PRUSSIA DURING THE WAR YEARS, 1916-1918

Year	Deaths in Prussia	Deaths Among the War Injured
1913	620,455	.....
1914	766,828	101,227
1915	902,025	238,758
1916	787,669	170,977
1917	848,479	143,480
1918	1,015,660	182,824

Leaving out of consideration the deaths due to the direct action of force (war injuries), there are four main causes of death (diseases) that have left their stamp on the mortality during the three years 1916 to 1918, inclusive. These are: (1) influenza; (2) pneumonia, which is so closely associated with influenza; (3) tuberculosis, and (4) senility, so far as old age may be regarded as a distinct disease.

Deaths from influenza in 1913 were: 3,010 (0.72 per 10,000 of population); in 1914, 3,121 (0.74); in 1915, 4,016 (0.95); in 1916, 4,249 (1.01); in 1917, 4,411 (1.04), and in 1918, 120,612 (28.43).

Deaths from pneumonia in 1913 were: 50,084 (12.03); in 1914, 50,002 (11.84); in 1915, 53,886 (12.76); in 1916, 55,542 (13.15); in 1917, 63,803 (15.04), and in 1918, 107,965 (25.45).

Deaths from tuberculosis in 1913 were: 56,861 (13.65); in 1914, 58,577 (13.87); in 1915, 61,006 (14.45); in 1916, 66,544 (15.76); in 1917, 87,032 (20.52), and in 1918, 97,581 (23.00).

Deaths from senility in 1913 were: 65,442 (15.71); in 1914, 71,783 (17.00); in 1915, 76,489 (18.12); in 1916, 82,291 (19.49); in 1917, 99,517 (23.46), and in 1918, 92,965 (21.91).

Disregarding the deaths from war injuries, to these four causes were due, in the years 1916 and 1917, more than one third, and, in 1918, more than one half of the total number of deaths.

The war, with its baleful effects resulting from the food blockade, the scarcity of coal, the lack of physicians, the lack of medical remedies, etc., exerted a decisive influence in bringing about an increase of deaths due to the four named causes—even though we leave the malignity of the influenza epidemic entirely out of account.

Marriages

WILLIAM H. WOOLSTON, Chicago, to Miss Alice Marie Gilmore of Detroit, at Evanston, Ill., February 24.

LEWIS WILBUR ALLEN, Westport, N. Y., to Miss Bardwell Field of Greenfield, Mass., February 25.

WARREN ENCELL MCCRARY, Lake City, Iowa, to Miss Mary Ashton in Clarion, Iowa, November 28.

EDWIN G. BANNICK, Wilton Junction, Iowa, to Miss Vesta Meredith of Atlantic, Iowa, recently.

GEORGE THOMAS RANKIN, Akron, Ohio, to Miss Maude Foard of Chicago, February 25.

ALBERT R. TORMEY, Madison, Wis., to Miss Beatrice Barnes of Milwaukee, January 18.

Deaths

Edward Mussey Hartwell, Boston; Miami Medical College, Cincinnati, 1882; secretary of the statistics department, City Hall, Boston; died, February 19, at Jamaica Plain. Dr. Hartwell was born in Exeter, N. H., in 1850, and received his Ph.D. at Johns Hopkins University, Baltimore, 1881; former vice principal of the high school at Orange, N. J., and teacher at the Boston Latin School; associate physical training, and director of the gymnasium at Johns Hopkins University, 1879-1880; chairman of the Massachusetts Commission for the Blind; served as special expert agent of the U. S. Department of Labor in Europe, 1888-1889; member of the Boston Society for Medical Improvement and the American Statistic Association.

Daniel McMartin Stimson, New York; Medical Department of Columbia College, New York City, 1868; formerly visiting surgeon to St. Peter's Hospital, and the Alms House and Lunatic Asylum, Albany, N. Y.; attending surgeon Presbyterian Hospital, Mount Sinai Hospital, New York Skin and Cancer Hospital, and other institutions; formerly professor of anatomy, Woman's Medical College, New York; member of the Medical Society of the State of New York; died, February 21, aged 78, from senility.

Frank Byrnes ⊕ Chicago; Rush Medical College, Chicago, 1894; clinical professor of surgery, Bennett Medical College, Chicago; formerly on the staff of the Cook County Hospital; formerly assistant professor of anatomy, Rush Medical College, and instructor in surgery at the Illinois Medical College, Chicago; died, February 1, at the John B. Murphy Hospital, aged 59, following an operation for carcinoma of the bladder.

Joseph Ward Battershall, Attleboro, Mass.; College of Physicians and Surgeons in the City of New York, 1874; member of Medical Society of the State of New York; specialized in roentgenology; formerly physician in the Pacific Mail Steamship service and physician in the British emigration service in London, Australia and China; died, February 24, aged 79.

Leona Estelle Todd ⊕ Willard, N. Y.; Cornell University Medical College, Ithaca, N. Y., 1905; formerly physician at the Memorial Hospital, Worcester, Mass., the Hudson River State Hospital, Poughkeepsie, N. Y., and the Buffalo State Hospital, Buffalo; member of the American Medico-Psychological Association; died, February 21, aged 51.

Simeon A. Pennington, Port Arthur, Texas; Medical Department, University of Nashville, 1900; former member of the Louisiana state legislature; specialized in ophthalmology, otology, laryngology and rhinology; died, February 16, aged 45, in the Mary Gates Hospital, following an operation for appendicitis.

Heber Bishop, Boston; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1882; formerly on the staff of St. Thomas' Hospital, London, England; member of the College of Physicians and Surgeons, Montreal; surgeon, C. A. M. C., Quebec, since 1882; died, February 20, aged 63, from heart disease.

⊕ Indicates "Fellow" of the American Medical Association.

Marshall Ford Morris, Atlanta, Ga.; Medical Department of Emory University, Atlanta, 1916; member of the Medical Association of Georgia; on the staffs of the Grady Hospital, the Georgia Baptist Hospital and the Davis-Fischer Sanatorium; died, February 18, aged 27, from heart disease.

John Andrews Ballard, Galesburg, Ill.; Chicago Medical College, Chicago, 1868; formerly surgeon of the Burlington and Milwaukee Railroad, La Crosse, Wis.; veteran of the Civil War; died, February 18, aged 80, in St. Mary's Hospital, from heart disease.

Joseph Watson Martindale ⊕ Camden, N. J.; Jefferson Medical College, Philadelphia, 1895; secretary and historian of the Camden City and County Medical Societies; member of the Philadelphia Medical Society; died, February 22, aged 57, from pneumonia.

J. H. Tripp, Tullahoma, Tenn.; University of Tennessee College of Medicine, Memphis, 1885; Confederate veteran; in 1905 organized the Tullahoma Cavalry, First Tennessee Regiment, and served as captain of the company; died, February 10, aged 79.

John Jason Owen, Newcomb, N. Y.; Dartmouth Medical School, Hanover, N. H., 1894; member of the Medical Society of the State of New York; died, February 16, aged 55, at Moses-Ludington Hospital, Ticonderoga, N. Y.; from pleuropneumonia.

Lewis Lee Thompson, Gridley, Calif.; University of California Medical School, San Francisco, 1902; former health officer of Butte County; at one time served as surgeon, U. S. Navy; died, February 16, aged 45, following a long illness.

Neill Duncan MacArtan, Tucson, Ariz.; North Carolina Medical College, Charlotte, 1909; first lieutenant, M. C., U. S. Army, retired; medical officer in charge of U. S. Public Health Service Hospital No. 51; died, February 8, aged 38.

Theodore Frickenstein, Brooklyn; New York Medical College, 1864; member of the Medical Society of the State of New York; practitioner in Brooklyn for more than half a century; died, February 22, aged 87, from heart disease.

Wyatt Reid Arnold, Bedford, Va.; College of Physicians and Surgeons, Baltimore, 1886; member of the Medical Society of Virginia; died, January 21, at the Lewis-Gale Hospital, Roanoke, aged 56, from tuberculosis.

Adrian Young Reid, New York; Medical Department of the University of the City of New York, 1880; member of the Medical Society of the State of New York; died at Pleasantville, N. Y., February 18, aged 73.

James Woodbury Twombly, Stoughton, Mass.; Medical School of Harvard University, Boston, 1911; died, February 21, aged 37, at the Massachusetts Eye and Ear Infirmary, following an operation for mastoiditis.

William Rice Marshall, Cleveland, Tenn.; Medical Department University of Nashville, Tenn., 1887; member of the Tennessee State Medical Association; died, February 17, aged 69, from cerebral hemorrhage.

John N. Phifer, Chicago; St. Louis Medical College, St. Louis, 1878; practiced in Shumway, Ill., for forty years; died, February 26, at the Washington Park Hospital, aged 73, from uremia, following an operation.

Merchant R. Billington, Chittenango, N. Y.; Castleton Medical College, Castleton, 1860; coroner of Madison County for fourteen years; member of the state legislature, 1877; died, February 15, aged 86.

Harry N. Chamberlain, Chicago; Jenner Medical College, Chicago, 1904; was found in a hallway suffering from a fractured skull, and died, February 24, aged 42, at the Cook County Hospital, Chicago.

Henry Augustus Reynolds, Worcester, Mass.; Medical School of Harvard University, Boston, 1864; formerly city physician of Bangor, Me.; veteran of the Civil War; died, February 13, aged 82.

William N. Williamson, Indianapolis; Medical Department of Butler University, Indianapolis, 1880; president of the Northwestern State Bank; formerly a schoolmaster; died, February 21, aged 67.

Harry Crawford Many, Honesdale, Pa.; Jefferson Medical College, Philadelphia, 1897; formerly served as assistant surgeon, M. C., U. S. Army, Manila, P. I.; died, February 17, aged 45.

Augustus E. Ackerson, Jersey City, N. J.; Medical Department of the University of the City of New York, 1892; was

found dead in bed, February 23, from gas asphyxiation, aged 51.

David F. Wilson, Hampton, Ark.; Arkansas Industrial University Medical Department, Little Rock, 1891; member of the Arkansas Medical Society; died, January 28, aged 60.

Charlotte Hooker Fay, Chicopee Falls, Mass.; Women's Medical College of Pennsylvania, Philadelphia, 1883; formerly a school teacher; died, February 15, aged 69.

York Russell, New York; Howard University School of Medicine, Washington, D. C., 1898; member of the Medical Society of the State of New York, died recently.

Darwin Crawford Smith, Lewistown, Pa.; Homeopathic Medical College of Philadelphia, 1869; died, February 12, aged 75, from fatty degeneration of the heart.

John Orel Meyers, Chicago; Bennett Medical College, Chicago, 1912; member of the Illinois State Medical Society; died, February 22, aged 49, from heart disease.

William P. Clothier, Buffalo; University of Buffalo, 1875; member of the Medical Society of the State of New York; also a pharmacist; died, February 5, aged 82.

James P. Wright, Springfield, Mo.; University of Louisville Medical Department, Louisville, Ky., 1874; died, February 14, aged 78, from cerebral hemorrhage.

James D. Nye, Denver; Hahnemann Medical College and Hospital, 1883; died suddenly, aged 71, from heart disease while testifying in a contested will case.

Charles Mason Thomas, Healing Springs, Va.; Georgetown University School of Medicine, Washington, D. C., 1897; died, February 17, aged 54, from empyema.

Thomas A. Wood, Dawson, Ga.; University of Georgia Medical Department, Augusta, 1886; died, January 1, aged 65, from cerebral hemorrhage.

Lawrence F. Smith, Newark, N. J.; University and Bellevue Hospital Medical College, New York City, 1899; died, February 13, from erysipelas.

John Bruce E. Clifford, Santa Barbara, Calif.; California Medical College, San Francisco, 1894; died, February 12, from cerebral hemorrhage.

Samuel M. Voris, Columbus, Ind.; Jefferson Medical College, Philadelphia, 1870; served during the World War; died, February 21, aged 75.

Chas. N. Daman, Syracuse, N. Y.; Jefferson Medical College, Philadelphia, 1881; died, February 18, aged 67, following a short illness.

William A. Muncey, Virgil, N. Y.; Eclectic Medical College of the City of New York, 1882; died, January 28, aged 90, from pleurisy.

John Sebastian Guinan, Whitehall, N. Y.; Albany Medical College, Albany, N. Y., 1893; died, February 11, aged 51, from carcinoma.

John Isbell ✦ Washington, Mo.; University of Virginia Department of Medicine, Charlottesville, 1867; died recently, aged 77.

Edward Hamilton Holbrook, Los Angeles; University of Maryland, Baltimore, 1868; died suddenly, February 1, aged 76.

Isabella S. Hotchkiss, Tacoma, Wash.; Chicago Homeopathic Medical College, Chicago, 1880; died, January 22, aged 82.

F. A. Thomas, Americus, Ga.; University of Georgia Medical Department, Augusta, 1880; died, February 15, aged 66.

Thomas J. Blackwood, Newcastle, Pa.; Jefferson Medical College, Philadelphia, 1866; died, February 10, from senility.

James John Johnson, Biggers, Ark.; Memphis Hospital Medical College, Memphis, Tenn., 1896; died recently, aged 54.

Augustine John Donnelly, Hopkinton, Mass.; McGill University Faculty of Medicine, 1900; died, February 9, aged 44.

Thomas Jefferson Moneyhon, Brooksville, Ky.; Medical College of Ohio, Cincinnati, 1882; died recently, aged 71.

David Jamieson, Barrie, Ontario, Canada; Trinity Medical College, Toronto, 1896; died February 10, aged 55.

Adolph Neubert, St. Louis; Humboldt Medical College, St. Louis, 1869; died, February 9, aged 78.

William B. Yeates, Taylor, Ark. (license, Arkansas, 1903); died, February 14, aged 63.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

PULVANE

In a twelve-page pamphlet, sent out by the Pulvane Laboratories, Inc., of Des Moines, Iowa, and purporting to deal with "The Therapy of Pulvane, an advanced method for the treatment of Respiratory Diseases," we are told that Pulvane "was developed in a United States Army General Hospital by officers of the Medical Department."

Pulvane "originally was intended only for its germicidal action upon tubercle bacilli in the lung," but it is now also recommended for asthma, hay fever, bronchitis, rhinitis, laryngitis and "other affections of the air passages." Of the alleged action of Pulvane on tuberculosis we read:

> "It destroys the spores of the bacilli as well as the germs themselves. It prevents infection of new areas by aspiration, gravity or surface contact.
>
> "In cases where sputum is positive it is a very noteworthy fact that shortly after treatment is begun, the bacilli begin to disappear, gradually diminish in number, and finally the sputum becomes negative."

Pulvane is administered, by inhalation, at the offices of the Pulvane Laboratories, Inc. Its "discoverer" chanced on a method of "introducing into solution and volatilizing a certain germicide, extremely rare in its usage because of its resistance heretofore to attempts to bend it to scientific will." This "rare" medicament is alpha naphthol! But since the discovery of this volatilizing method "three other ingredients of high therapeutic value have been added." What are these other ingredients?

> "They would be named were it not that Pulvane requires special technique in its preparation and administration. Our medical directors do not consider it advisable to identify them here because of the possibility of incompetent hands attempting their use. The medical directors, however, will be glad to name every ingredient of Pulvane for any reputable member of the profession. Pulvane Laboratories reserve only the method of compounding."

Presumably, therefore, if physicians desire to know what Pulvane is, the Pulvane Laboratories, Inc., "will be glad to name every ingredient of Pulvane." It is worth noting that nothing is said about quantities. It is also worth remembering that "Peruna" and some other "patent medicines" have for years printed on the label the *names* of the alleged ingredients. How much longer is the medical profession going to be fooled with the trick of nostrum exploiters pretending a frankness that means nothing?

From a recent issue of a Des Moines newspaper we learn that the Pulvane Laboratories are about to establish a sanatorium where the Pulvane treatment can be given. This announcement is said to be made by John P. Mosher, the alleged discoverer of Pulvane. Mosher is not a physician. The newspaper article states, further, that Mosher's experiments were tried out "under the observation of Major Sharpe," commander at Fort Des Moines. It appears also that an ex-newspaper reporter is connected with the Pulvane Laboratories. The value of having a good publicity man is obviously recognized. There also seems to be connected with the concern a Dr. Harry P. Hall. We find in the records reference to one Harry P. Hall who was graduated by the Medical Department of Drake University of Des Moines, Iowa, in 1894, and was licensed in Iowa in 1896. Our records indicate that he has not been in practice for some years. We also find in our files some newspaper clippings regarding a Dr. Harry P. Hall who, in 1914, pleaded guilty to a charge of using the mails to defraud and was fined in the federal courts. Whether there is any connection between these two names, we do not know.

Reverting to the claims made by the Pulvane Laboratories that Pulvane was "developed in a United States Army General Hospital by officers of the Medical Department" the

following statement has recently been received by THE JOURNAL from Surgeon-General Ireland of the United States Army:

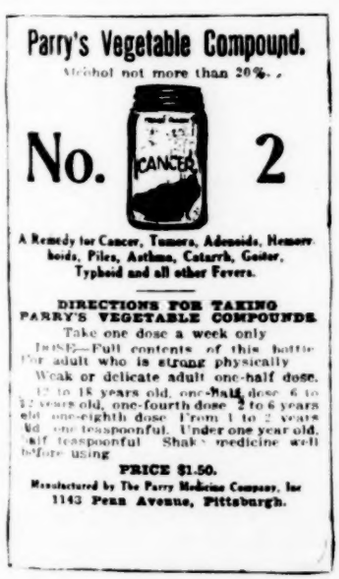
"It has been brought to my attention that a concern in Des Moines, Iowa, known as the Pulvane Laboratories ,has issued a pamphlet in which statements are made which would naturally lead medical men to believe that the experiments, etc., referred to therein were made with the approval of and more or less under the direction of the Medical Department of the Army. I wish to say that this is not so; that the Medical Department had nothing whatever to do with the matter and that it thoroughly disapproves of the methods used by the promoters of this concern."

MORE MISBRANDED NOSTRUMS

Abstracts of Recent Notices of Judgment Issued by the Bureau of Chemistry of the United States Department of Agriculture

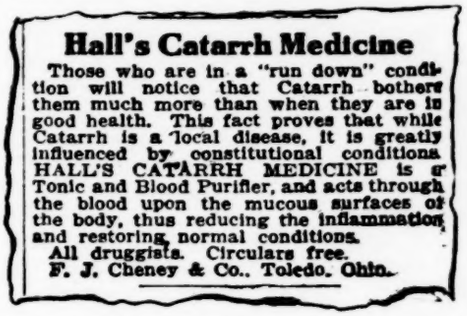
Blummer's Herb Tea.—In November, 1919, the Lincoln Chemical Work, Chicago, shipped a quantity of "Blummer's Herb Tea" into the state of Nebraska. Analysis of sample of the article by the Bureau of Chemistry showed that it was a mixture consisting essentially of althea (marshmallow) licorice, couch-grass, sage, senna, elder flowers, sassafras, with small amounts of anise, fennel, melissa (balm), American saffron, German chamomile, dandelion, liverwort and a trace of lungwort. The product was falsely and fraudulently represented as a blood purifier, a remedy against all lung troubles, cold, bladder disease, kidney disease, as a remedy for female complaints, stomach trouble, etc. Furthermore, it was misbranded in that, while the labels stated that the boxes contained 6 ounces, they were 24 per cent. shortweight. In July, 1921, a plea of guilty was entered and the court imposed a fine of $200 and costs.—[*Notice of Judgment No. 9591; issued Dec. 10, 1921.*]

Parry's Vegetable Compounds.—Readers of THE JOURNAL will remember the extended article on this product which appeared in the issue of Dec. 18, 1920, detailing the action of the Post Office Department in declaring the Parry Medicine Company a fraud and debarring it from the use of the U. S. mails. At that time it was brought out that "Parry's Vegetable Compounds," which were numbered consecutively from 1 to 14, were all essentially the same in composition, except for the flavoring material used. They were shown to consist of alcohol 25 per cent., olive oil 50 per cent. and water 25 per cent.



The Parry Medicine Company of Pittsburgh shipped from Pennsylvania to Maryland a quantity of Parry's Vegetable Compounds (Nos. 1 to 14 inclusive) which the government declared was misbranded. The different packages were recommended for cancer, tuberculosis, typhoid fever, appendicitis, Bright's disease, black plague, smallpox, leprosy, diabetes, snake bite, St. Vitus dance, weak eyes and many other conditions. These claims were all declared false and fraudulent. Each package bore the label "All goods guaranteed under the Pure Food and Drugs Act, June 30, 1906," a statement that was declared false and misleading. In April, 1921, the Parry Medicine Company entered an appearance as claimant for the property and a decree of condemnation and forfeiture was entered. The court ordered that the goods be released to this concern on payment of the cost of the proceedings, and the execution of a bond in the sum of $500, conditioned in part that the article be relabeled under the supervision of the Department of Agriculture.—[*Notice of Judgment No. 9435; issued Oct. 24, 1921.*]

Hall's Catarrh Medicine.—This nostrum was for years sold under the name "Hall's Catarrh Cure." In September, 1920, F. J. Cheney & Co., Toledo, Ohio, shipped a quantity of "Hall's Catarrh Medicine" into New York. When analyzed by the Bureau of Chemistry, the stuff was found to consist



essentially of potassium iodid, bitter plant extractives, cardamon, sugar, alcohol and water. The stuff was labeled, in part:

"Catarrh . . . nose, throat, ear passages, stomach, bowels, bladder, uterus, . . . small cavities, called antrums and sinuses . . . This form of catarrh . . . should be conquered at all costs."

"When the sense of smell has been destroyed by catarrh, Hall's Catarrh Medicine . . . assists in restoring normal conditions."

"Deafness . . . sometimes requires long treatment . . ."

The government charged that the above quoted statements "were false and fraudulent in that the article did not and could not produce the curative and therapeutic effects alleged in said statement, and, in fact, said article contained no ingredient or combination of ingredients able to produce the results claimed for it; that said statements . . . were misleading and were intended to deceive, and were wilfully, wrongfully and unlawfully branded, and added to said packages for the purpose and with the intent to deceive and mislead anyone needing such alleged remedy to believe and understand that said product would produce the curative effects stated." In January, 1921, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment No. 9506; issued Nov. 24, 1921.*]

La Derma Vagiseptic Discs.—The Palestine Drug Co. of St. Louis shipped in December, 1919, from Missouri to Oklahoma, a quantity of this product which was declared misbranded. The federal chemists reported that analysis showed the discs to consist essentially of common salt, a small amount of alum, sugar, starch and talc. The article was labeled in part:

"For . . . Amenorrhea and other Uterine and Vaginal Disorders."

"Ulceration of the Uterus and Catarrh of the Uterus . . . Gonorrhea."

These claims were declared false and fraudulent and in November, 1920, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment No. 9598; issued Dec. 10, 1921.*]

Women's Pills.—In September, 1920, the Fitzpatrick Drug Co., Helena, Ark., shipped into Kansas a certain quantity of "Women's Pills." These, when analyzed by the federal chemists, were reported to consist essentially of castile soap, alkaline carbonates, and unidentified plant extractives. They were labeled in part as follows:

"Women's Pills Will bring the Menstrual periods regular . . . if the period should pass 3 days and menses do not come double the dose."

These claims were declared false and fraudulent in that the pills contained no ingredient or combination of ingredients capable of producing the effect claimed. In January, 1921, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment No. 9576; issued Dec. 10, 1921.*]

Correspondence

ACTION OF MAGNESIUM SULPHATE IN NONSURGICAL DRAINAGE OF THE GALLBLADDER

To the Editor:—The editorial, Feb. 4, 1922, p. 350, on the "Action of Magnesium Sulphate on the Gallbladder," prompts me to give another theory on the physiology involved. The explanation of the action of this drug, in this location, can best be understood by considering the simple laws of osmosis in addition to the law of contrary innervation. The latter can explain only the relaxation of spasms or contractions of the muscle, while the osmosis theory will account for the removal of congestion which is always present in pathologic cases.

It is a well established fact that nature tries to keep all fluids, even though separated by a membrane, as nearly isotonic as possible, and to do this the "flow" is always toward the hypertonic side. Witness the copious watery stool after taking large doses of magnesium sulphate for its laxative effect, and again the fact that a strong magnesium sulphate enema can seldom be retained for more than one hour, and then the amount expelled is from two to three times the quantity introduced. Also the reverse is true: when water is introduced into the bowel it is absorbed more readily than physiologic sodium chlorid solution because the blood is more hypertonic to the water than to the latter.

Recognizing the fact that magnesium sulphate has this marked hydroscopic property, one can easily account for the phenomena observed when a hypertonic solution is kept in contact with the duodenal mucosa. Such treatment will give relief only to patients who have a congested, swollen area either in or around the common duct, due to an infection in the ducts themselves, the head of the pancreas or from injury produced by a moving stone. If a hypertonic solution is applied to this swollen area, a flow of at least the watery portion of this area into the hypertonic solution occurs by osmosis. First the congestion around the ampulla of Vater is reduced and the occluded duct opens, and we have the so-called bile A, or bile from the common duct. If there is no congestion above the ampulla, the mechanical distention of the duodenum or the presence of the bucket excites a contraction of the gallbladder, and bile B will follow at once. This contraction of the gallbladder may even take place before the ampulla has opened so that it is impossible to separate the A and B bile. If the cystic duct is swollen, it may take hours to relieve the congestion there, yet bile from the liver may be flowing freely.

By accepting this theory of osmosis one can readily see that magnesium sulphate does not have a specific action; that it does not produce a flow of bile but simply removes the obstruction to its flow. Hence in normal cases there is no effect. Any hypertonic solution kept in contact with the duodenal mucosa will act as well. The presence of any food or drug in the duodenum may cause a contraction of the gallbladder and an increase of bile, provided the duct is not occluded.

Even though the specific action is denied, one cannot discount in certain cases this nonsurgical drainage of the gallbladder, and the clinical fact that the patients are relieved places it among our most valuable therapeutic agents, no matter what theory as to the action we accept or reject.

The essential thing is to keep a hypertonic solution constantly present in the region of the ampulla, as the liquid passes readily into the third portion of the duodenum, where its value in gallbladder cases is lost. When the body is in the horizontal position, the first portion of the duodenum descends as it passes over the body of the vertebrae to the right side and is in close relation to the neck of the gallbladder. The second portion is to the right of the vertebrae and parallel to them. This portion fortunately has the opening for the biliary tract, and at the same time (when in the horizontal position) it is the lowest portion of the entire alimentary tract, being retroperitoneal and immobile. The third portion again rises over the body of the vertebrae and passes to the left side, where the fourth portion again ascends to join the jejunum. Placing the patient flat on his back or on his right side results in the formation of a U shaped trap (as used in all sewerage systems), with the second portion of the duodenum the bottom of the U. By filling this "trap" with repeated doses of magnesium sulphate by mouth, one can keep a hypertonic solution in contact with the entire second portion of the duodenum without the use of the duodenal tube. Ten cubic centimeters of a saturated solution in a lactated pepsin vehicle is given every hour. No other water or food is given for five hours, when a dry meal is allowed. This treatment can be continued until a stool containing bile is produced, after the first five hours allowing food when desired but withholding all liquids and keeping the patient flat on his back or on his right side all of the time. If necessary to continue the treatment for more than one day, a rest with all water desired is given during the night.

The rationale of this procedure is further augmented by the roentgen ray, as clinicians report that in cases of biliary disease the second portion fills rapidly but empties slowly. This again favors the retention of the salts in this location in cases with obstruction, while in normal cases it would pass on more readily.

One patient who had required six hypodermic injections of a sedative for pain was relieved in four hours by the treatment described above, but in the majority of cases the distress seems to be present until after the dry meal.

This is presented at this time, not as an established fact, but with the hope that others who are interested in this work will be stimulated anew.

B. L. Knight, M.D., Cedar Rapids, Iowa.

"THE OVARY AND THE ENDOCRINOLOGIST"

To the Editor:—May I comment on an article entitled "The Ovary and the Endocrinologist," by Dr. Robert T. Frank, which appeared in The Journal, January 21? I have been hoping that some one, interested in the subject and realizing the benefit from certain types of organotherapy, might answer Dr. Frank's rather scathing remarks anent the subject of ovarian organotherapy. I will agree that the rank commercialism which has enveloped the field of endocrinology has done much to discredit it. I have no use for the exploiter of the "shot gun mixtures," or the pluriglandular products, put upon the market and foisted upon the profession by means of "therapeutic" advertising pamphlets, postcards, etc. Dr. Frank's allusion to the "endocrinopractor" is well made. I must take issue with him, however, in regard to ovotherapy of a rational and common sense type. I cannot understand his pessimism. When he says that corpus luteum extracts, ovarian extracts and ovarian residue are inert, and shows his disbelief that beneficial results are obtained in the functional amenorrheas, certain types of dysmenorrhea and in the treatment of the symptoms of the artificial and physiologic menopause, I believe that the products he used have either been of poor preparation, not fresh, or that his therapy has been incomplete. Ovarian organotherapy must be prolonged, continuous and regularly applied to obtain results, and fresh glandular products must be used. The miraculous effect of

luteum extract in amenorrhea of the functional type, combined with thyroid extract where obesity is coexistent, in dysmenorrhea not referable to mechanical causes and in the early symptoms of the menopause, is too well known to me and many others to allow Dr. Frank to discredit it without a word of protest.

ADAM P. LEIGHTON, JR., M.D., Portland, Maine.

"A TECHNIC FOR THE REPAIR OF RELAXED OR LACERATED PERINEUM"

To the Editor:—I was much interested in reading Dr. R. L. Payne's discussion of perineal repair in THE JOURNAL, February 25. I believe that his suggestion as to freeing the rectal wall from the levator ani is a good one, the only objection being an incision so close to the rectal wall. Replacement of the herniated bowel, a procedure that has received very little attention in the literature, is as important here as in any other location.

A great deal of useless attention has been given to different methods of performing perineorrhaphy. The points of traction, line or lines of incision, and shaping of mucosal flaps are of little significance. More time spent in a careful dissection of the perineum and identification of fascia as well as muscle will give a larger percentage of successful results. A continuous suture should never be used when the suture is under tension.

When it becomes generally recognized that perineorrhaphy is nothing more nor less than a herniotomy, more satisfactory results will follow.

RAYMOND L. BRADLEY, M.D., Houston, Texas.

"A COURT OF DECENCY FOR PHYSICIANS"

To the Editor:—I believe that some of the ideas in Dr. Croftan's letter (THE JOURNAL, Feb. 25, 1922, p. 601) are timely—or, shall I say, a little tardy? One hears many complaints nowadays of maltreatment against the other fellow, which are found on investigation to be either imaginary or vindictive, and especially vindictive when the other fellow attempts to force payment for service honestly rendered. Such a court, if we have one, will have to be made up of what is known as "full-time men." I think Dr. Croftan is right in saying that it is "driving a cold wedge between physician and patient," and that "the tendency is for the doors to be thrown open to questionable practices, professional and financial, chiefly along the lines of needless surgery, needless diagnostic fussing, and unduly prolonged courses of treatment, with needless hospitalization and consequently needless expense."

The great bulk of our practice is made up of middle class people. The poor have their county doctors or dispensaries, and the wealthy patient somehow or other gets away from us. The erratic element, or that class of wealthy people with ungeared minds, pursues the shade of Mary Baker Glover Patterson Eddy, and the greater class with normal minds and sound judgment changes climate, or goes to fashionable resorts or sanatoriums. Persons of the middle class are at our mercy, as they are either too proud to appeal to free dispensaries, or cannot afford to change climate or go to sanatoriums, and they are usually too intelligent to chase after shades. Why should we not try to retain their confidence?

We are too ready to railroad the sick to hospitals, thereby subjecting them sometimes to unnecessary expense. Many hospitals nowadays insist on having special nurses night and day. I know that we must use the hospitals in surgical cases, but we have to admit that with such exceptions as the charity hospitals or county institutions, the management of many hospitals is cold blooded. The patient recovers with a grievance against both the hospital and the physician.

Then, again, we are becoming ultrascientific. We read scientific journals telling how Professor So and So reaches his diagnosis by making a spinal puncture, or how he passes a stomach tube and how he makes a gastric or duodenal analysis; or how he catheterizes the ureter, and how he uses a cystoscope and rectoscope and bronchoscope, and so on. Then, when a patient comes into our office we try some of those stunts and the patient either faints on our hands or goes away hurt or offended, never to return again.

Why can't we use our five senses as the old time clinicians used to do until we see that certain special technic and analysis must be made? Then we shall have the confidence of the patient, and we can put it up to him whether he wants the procedure or not. Needless surgery is another cause that is "driving the cold wedge" between the general practitioner and the patient. Many unnecessary operations have been and are being performed on patients whose histories show they had or have absolutely no relief from the operations. Appendixes are removed when the foci of the troubles are elsewhere, as in the lungs, stomach, gallbladder, tonsils, teeth or nerves.

If a court of decency is necessary, let us have it; and the sooner the better, if it will help to retain the confidence of the public.

A. J. CAFFREY, M.D., Milwaukee.

EPIDEMIC JAUNDICE

To the Editor:—In an item on suspicious cases of epidemic jaundice in New York State (THE JOURNAL, Jan. 14, 1922, p. 117), this disease is referred to as having been "rarely reported in the United States." The disease, as manifested in my experience, has extended over two years, going from family to family in the rural districts as well as the city, having its greatest incidence in children and adolescents, although adults have not been immune. The disease has been more prevalent in the fall. The first cases presented early symptoms which were rather difficult to differentiate from those found in acute appendicitis, gallbladder trouble or peritonitis, diagnosis being confirmed only after observing other cases appearing about the same time, and by the appearance of jaundice on the third or fourth day. The method of infection was undoubtedly by direct transfer. If there was one case in the family there would invariably be others. Other children who attended the same school would be attacked. It has kept up to the present time, without deaths or apparent damage to the patient, each case varying in intensity, and running its course in from three days to four weeks.

G. E. BURMAN, M.D., Carthage, S. D.

A PLETHORA OF PHYSICIANS

To the Editor:—Recently several of our leading daily newspapers have claimed that there is quite a scarcity and shortage of physicians in certain localities in eastern states. I have also noticed similar complaints from various boards or committees whose statements appeared in THE JOURNAL. In some instances it has been thought advisable to lower entrance requirements, shorten, cheapen and in other ways make the entire curriculum and qualification easier as an inducement to young men to enter the medical profession. Stop all such propaganda. There are more idle physicians in Texas and Oklahoma than are necessary to fill all the needs and openings in the United States. In every nook and

corner in Texas there are from three to five physicians where one or two would abundantly suffice. A simple remedy would be to grant reciprocity—more liberally and reasonably—and advertise the places where physicians are needed and can earn and collect a good income.

E. H. MORGAN, M.D., Granbury, Texas.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

SWEEPING COMPOUND—ANT EXTERMINATORS

To the Editor:—1. Please give me a good formula for preparing a floor sweeping compound such as we commonly buy mixed with sawdust.

2. Is there any known efficient remedy for the cutting ant as we see it here in Mexico and South Texas? This is not just in your line, but we have written the Department of Agriculture and Experiment Stations, and their remedies are no better than ours. The ants destroy whole plants in one night, sometimes. We have tried smoke underground, potassium cyanide mixture, insect powder and numerous other things. And, by the way, the insect powder has them all beaten, only it is very expensive in any quantity such as we require.

W. S. WILKISON, M.D., Cloete, Coahuila, Mexico.

ANSWER.—1. The "Scientific American Cyclopedia of Formulas" suggests this formula for a satisfactory sweeping compound:

Melt 2 ounces (60 gm.) of paraffin in 2 quarts (2 liters) of liquid petrolatum over a water bath; then add 6 ounces (170 gm.) of coarse salt, 5 pounds (2.25 kg.) of sea sand, 10 pounds (4.5 kg.) of sawdust, and finally add 1 ounce (30 c.c.) of oil of eucalyptus, the latter serving to provide a satisfactory odor.

2. Among the various methods which have been suggested for clearing out ants are the following:

1. Drop quicklime on the mouth of the nest and wash it in with boiling water.

2. Pour in boiling water in which camphor or tobacco has been steeped.

3. A spray of benzin from an atomizer is sudden death to most insects. It must, however, be carefully handled because of the possibility of explosion.

4. Powdered borax sprinkled around the infested places will exterminate both red ants and black ants.

DILUTED MERCURIAL OINTMENT INTERNALLY

To the Editor:—1. How long would a few grains of Unguentum Hydrargyri Dilutum, U. S. P. (blue ointment) remain in the stomach of a healthy child, aged 2 years, if ingested three hours after its last meal? 2. Would the mercury in this preparation be converted into a soluble salt of mercury in the stomach, or in the intestine? 3. About what quantity would be dangerous to life for a child of 2 years, of the foregoing preparation? 4. What steps should be taken to counteract the effects of an unknown quantity, not exceeding 20 grains (1.3 gm.), if the patient was seen thirty minutes after ingestion?

NEWTON G. WILSON, M.D., Fieldale, Va.

ANSWER.—1. Not very long.

2. In the intestine.

3. The quantity could not be stated categorically, but it would be more than a few grains.

4. The contents of the stomach should be evacuated by means of the stomach tube, and a saline purgative should be given.

MERCURIC CHLORID IN SCABIES

To the Editor:—Please tell me whether 30 grains of mercuric chlorid to 1 pint of water would be too strong to apply to the skin in a case of scabies.

R. A. REGER, M.D., Buckhannon, W. Va.

ANSWER.—Thirty grains (2 gm.) of mercuric chlorid to a pint (500 c.c.) of water—that is, a 1:250 solution—can be used for washing small areas of unbroken skin without producing irritation, if it is not done too often, but it is much too strong to apply to an inflamed skin like one affected with scabies. It is too strong to use as a general wash over the whole body, even with an unbroken skin. Mercuric chlorid is not the proper parasiticide for scabies.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ARIZONA: Phoenix, April 4-5. Sec., Dr. Ancil Martin, 207 Goodrich Bldg., Phoenix.

COLORADO: Denver, April 4. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

CONNECTICUT: Hartford, March 14-15. Sec., Reg. Bd., Dr. Robert L. Rowley, 79 Elm St., Hartford.

CONNECTICUT: New Haven, March 14. Sec., Eclec. Bd., Dr. James E. Hair, 730 State St., Bridgeport. Sec., Homeo. Bd., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven.

DISTRICT OF COLUMBIA: Washington, April 11. Sec., Dr. Edgar P. Copeland, 1315 Rhode Island Ave., Washington.

HAWAII: Honolulu, April 10. Sec., Dr. G. C. Milnor, 401 Beretania St., Honolulu.

IDAHO: Boise, April 4. Director, Mr. Paul Davis, Boise.

ILLINOIS: Chicago, March 27-29. Director, Mr. W. H. H. Miller, Springfield.

IOWA: Des Moines, March 21-23. Sec., Dr. Rodney P. Fagen, Capitol Bldg., Des Moines.

MAINE: Portland, March 14-15. Sec., Dr. Frank W. Searle, 775 Congress St., Portland.

MASSACHUSETTS: Boston, March 14-16. Sec., Dr. Samuel H. Calderwood, State House, Boston.

MINNESOTA: Minneapolis, April 4-6. Sec., Dr. Thomas S. McDavitt, 539 Lowry Bldg., St. Paul.

MONTANA: Helena, April 4. Sec., Dr. S. A. Cooney, Power Bldg., Helena.

NEW MEXICO: Santa Fe, April 10-11. Sec., Dr. R. E. McBride, Las Cruces.

OKLAHOMA: Oklahoma City, April 11-12. Sec., Dr. J. M. Byrum, Shawnee.

PORTO RICO: San Juan, April 4. Sec., Dr. M. Quevedo Baez, Box 804, San Juan.

RHODE ISLAND: Providence, April 6-7. Sec., Dr. Byron U. Richards, State House, Providence.

UTAH: Salt Lake City, April 4. Director, Mr. J. T. Hammond, Salt Lake City.

Louisiana December Examination

Dr. Roy B. Harrison, secretary, Louisiana State Board of Medical Examiners, reports the written examination held at New Orleans, Dec. 1-3, 1921. The examination covered 12 subjects and included 100 questions. An average of 75 per cent. was required to pass. Of the 14 candidates examined, 11 passed and 3 failed. Two candidates were licensed by reciprocity. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Indiana University	(1917)	84.3
Kentucky School of Medicine	(1905)	75*
Tulane University	(1914) (1921) 83.6, 84.9, 85.5†, 88.3†	90.2,
University of Oklahoma	(1917)	86.4
University of the South Medical Department	(1909)	85.1
Vanderbilt University	(1920) 84.7, (1921)	79.7
FAILED		
University of Illinois	(1920)	73.9
Meharry Medical College	(1917) 45.4, (1918)	62.4

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Maryland		(1905)	Maryland
Harvard University		(1917)	Minnesota

* Credit given for years of practice.

† These candidates have received temporary permits until completion of citizenship.

Pennsylvania Reciprocity Report

Mr. C. D. Koch, director, Professional Credentials Bureau, Bureau of Medical Education and Licensure of Pennsylvania, reports that, during 1921, 16 candidates were licensed by reciprocity. Eleven candidates were licensed by endorsement of credentials. Four candidates were registered on the basis of military service. The following colleges were represented:

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington University		(1908)	Dist. Colum.
Howard University		(1906)	Georgia
Loyola University		(1919)	Illinois
University of Illinois		(1917)	Illinois
Indiana University		(1909)	Indiana
College of Physicians and Surgeons, Baltimore		(1915)	W. Virginia
Johns Hopkins University		(1914), (1917)	Maryland
University of Maryland		(1917)	Delaware
Boston University		(1913)	S. Carolina
Washington University		(1914)	Missouri
Medico-Chirurgical College of Philadelphia		(1916)	Delaware

University of Pennsylvania.....(1910) Virginia, (1916) N. Carolina
University of Pittsburgh.....(1916) Ohio
University of Vermont.....(1919) Vermont

College	ENDORSEMENT OF CREDENTIALS	Year Grad.	Endorsement with
Johns Hopkins University		(1919)	N. B. M. Ex.
Jefferson Medical College		(1916)	U. S. Army
Medico-Chirurgical College of Philadelphia		(1916)	U. S. Army
University of Pennsylvania	(1916), (1917) (1918, 3), (1919, 6) Nat'l Bd. Med. Ex.		U. S. Army
Woman's Medical College of Pennsylvania		(1918)	N. B. M. Ex.

Book Notices

LA FIBRE RECURRENTE EN GENERAL Y PARTICULARMENTE EN VENEZUELA. Por el Doctor R. Pino-Pou. Paper. Pp. 115, with 11 illustrations. Caracas: Aguerrevere & Guruceaga, 1921.

The first case of relapsing fever in Venezuela was reported by the author in January, 1918. Since that date he has studied other cases and carried out laboratory investigations, especially as regards the morphology and pathogenic action of the causative agent. In the present book he reviews the subject in general, as regards etiology, geographic distribution, morphology, diagnosis, complications, prognosis and mortality. Pino-Pou lays special stress on the conclusions of Darling at Panama and Franco at Colombia. In Venezuela the disease has so far been found only in two states, Táchira and Guayana. The mortality seems low, and the prognosis is rather favorable. In Venezuela, relapsing fever is caused by a spirochete, apparently different from the European and African varieties and Novy's American strain, but identical to those observed in Colombia, Panama and Peru. Both rats and mice are readily infected by the germ. One of the characteristics of the South American species is its scarcity in peripheric blood. In Venezuela the insect carrier is an ornithodorus, it being also possible that bedbugs may play a part in transmission. Arsphenamin and neo-arsphenamin seem to be specific curative agents. While Dr. Pino-Pou's book is in a way an extension of Darling's and Franco's work, it represents a serious piece of research which has thrown more light on a disease now found practically all over the world. Incidentally, it shows the possibilities open to physicians in tropical regions who supplement their clinical observations with the aid of the laboratory.

SOUTH AMERICA FROM A SURGEON'S POINT OF VIEW. By Franklin H. Martin, C.M.G., M.D., F.A.C.S., Director-General, American College of Surgeons. Cloth. Price, $3. Pp. 325, with illustrations. New York: Fleming H. Revell Company, 1922.

This volume is the result of two visits to South America made by Dr. Martin and his colleagues on behalf of the American College of Surgeons, and it is offered in the nature of a report to the fellows of the college. The remarks of Dr. Martin on the general character of the countries and institutions visited are supplemented by comments of Drs. William J. Mayo and Thomas Watkins on medical education, on the hospitals and on other points of particular interest to them. The book is a guide to the important physicians and surgeons of South America, containing, in addition to their names, more than thirty portraits. There are numerous illustrations of the scenic features of the various countries visited, particularly of the medical institutions. A supplement of 100 pages gives a summary of facts concerning each country and an English, Spanish and Portuguese vocabulary for the use of the traveler.

THE VITAMINE MANUAL. A Presentation of Essential Data about the New Food Factors. By Walter H. Eddy, Associate Professor of Physiological Chemistry, Teachers College, Columbia University. Cloth. Price, $2.50 net. Pp. 121. Baltimore: Williams & Wilkins Co., 1921.

The widespread interest, not only among physicians, but also among the general public, in those comparatively newly discovered accessory food factors that we call vitamins, makes this manual especially valuable. A vast amount of misinformation is abroad on the subject of vitamins. It emanates, largely, from sources that have a commercial interest in misleading both the layman and the physician. The purpose of the manual has been to collate the existing data and "put it in a form which would be available for both student and layman"—and the purpose is excellently served. The chapters on "How Vitamins Were Discovered," "The Sources of the Vitamins" and "How to Utilize the Vitamins in Diets" will be found of more than usual interest, while Chapter 8, on "Avitaminoses or the Diseases that Result from Vitamin Deficiencies," will appeal particularly to physicians. The last twenty-seven pages of the book are devoted to a comprehensive bibliography. Altogether, the manual is one that can be highly recommended to physicians and others interested in the problems of nutrition.

MODERN ITALIAN SURGERY AND OLD UNIVERSITIES OF ITALY. By Paolo de Vecchi, M.D. Foreword by George D. Stewart, M.D. Cloth. Price, $5 net. Pp. 249, with 15 illustrations. New York: Paul B. Hoeber, 1921.

The work of Morelli, Forlanini, Bassini, Bastianelli and Ceci has attracted the attention of surgeons throughout the world. In the middle ages the universities of Italy were the Mecca of medical men from all countries. Between that period and the present, however, Italian medicine has not attracted world attention, and visitors to Europe have chosen France, England and Austria for educational purposes and Italy for art and ruins. During the World War the achievements of the Italian medical corps and the contributions of the Italian surgeons and scientists mentioned were as great as those of the medical men of any other European country. Dr. De Vecchi gives a general account of surgery in Italy today. As a background he offers a history of the ancient and present universities and scientific institutes of his country. His account is easily readable, and the book is excellently illustrated. It has the definite earmarks of the warm Italian temperment, being devoted almost wholly to praise, and giving, therefore, but one side of the story. It will serve well, however, to make apparent to American readers the great progress which Italy has made in the field of surgery.

THE HOT SPRINGS OF NEW ZEALAND. By Arthur Stanley Herbert, O.B.E., M.D., B.S., Consulting Balneologist to the Dominion of New Zealand. Cloth. Price, 15 shillings net. Pp. 284, with 87 illustrations. London: H. K. Lewis & Co., 1921.

The author is consulting balneologist to the Dominion of New Zealand, and in this book describes the mineral waters of that country especially for British readers. The book is timely, since many of the continental health resorts are not now accessible to British guests. Unlike most balneologists, Dr. Herbert is extremely conservative in his claims for the chemical and radioactive qualities of the waters, ascribing most of the benefits to the general hydrotherapeutic, climatic and psychic effects. That good results are achieved in certain instances is proved from the case reports and illustrations in the book. The book includes, not only a description of the various spas and the chemical and other qualities of their waters, but also some general discussions of the climatic and accessory treatment and of the general typography and environment of the health resorts. There are eighty-six beautiful illustrations of the various resorts and of the Maoris, who are a picturesque addition to the scenery.

TEXT-BOOK OF EMBRYOLOGY. By Frederick Randolph Bailey, A.M., M.D., and Adam Marion Miller, A.M., Professor of Anatomy, The Long Island College Hospital. Fourth edition. Cloth. Price, $6. Pp. 663, with 503 illustrations. New York: William Wood & Company, 1921.

The authors have modified their book by omitting the chapter on "The Cell," since the previous training of the student has probably brought to his attention the salient features of cell organization. Some of the old illustrations have been replaced by new ones, and a chapter on "Fetal Membranes" has been added.

OUTLINES FOR CASE TAKING AND ROUTINE WARD AND LABORATORY WORK, AS USED IN THE MEDICAL CLINIC OF THE WASHINGTON UNIVERSITY. By George Dock, A.M., M.D., Sc.D., Professor of Medicine, Washington University. Third edition. Cloth. Price, 50 cents. Pp. 53. Ann Arbor, Mich. George Wahr, 1921.

This is a useful guide in making good clinical histories worthy of the name at the present time.

Medicolegal

Physician Not Permitted to Testify from Memorandum

(McEwen v. New York Life Ins. Co. (Calif.), 201 Pac. R. 577)

The Supreme Court of California holds that, in an action on a policy of life insurance, a physician who, as the company's medical examiner, had examined the insured, was properly not allowed to testify as to whether the insured had informed him of an accident which had not been mentioned in the answers to the medical examination, when the physician had no independent recollection whatever of the examination and the memorandum from which it was desired by the plaintiff to have him refresh his memory or testify furnished evidence of its own unreliability; and, while it was signed by the witness, it was not shown that he wrote or dictated it, or that, at the time it was written, the fact was fresh in his memory, or that he knew that it was correctly stated. Nor, from the facts that the defendant company objected, under such circumstances, to the plaintiff's counsel questioning the physician, and the company did not itself call the physician as a witness, did the presumption arise that the physician's testimony would have been adverse to the company. The latter was under no obligation to call the physician as its own witness or to permit him to testify for the plaintiff, particularly in view of the fact that the physician was unable to recall the medical examination at all, and it did not appear that there was any legally competent memorandum which he might use to aid him in testifying.

Construction of Statute Requiring Submission to Operation—Case of Injured Knee

(Grant v. State Industrial Accident Commission (Ore.), 201 Pac. R. 438)

The Supreme Court of Oregon discusses at considerable length the right of an injured workman to compensation after he refuses to submit to a surgical operation, particularly under the statute of that state, which provides that, for such period as any workman shall refuse to submit to such medical or surgical treatment as the industrial accident commission deems reasonably essential to promote his recovery, his right to compensation shall be suspended. The court says that it has not discovered any jurisdiction under which the commission or other body administering the workmen's compensation statute is given arbitrary power to prescribe an operation under inevitable penalty of loss of compensation in case of refusal by the workman; nor does any statute to which the court's attention has been called make the right of refusal depend on the balance of medical opinion. The opinions of medical men, whether divided or unanimous, are not alone and of themselves necessarily controlling. In every jurisdiction, the right of the workman is dependent on his conduct, and his conduct is measured by the course which would be pursued by an ordinarily reasonable man.

When the Oregon statute is read in the light of the humane purposes which it was designed to accomplish and is viewed in the light of the rule which elsewhere has been adopted without dissent or protest, and is then interpreted liberally, as it ought to be, it will clearly appear that the words "reasonably essential" are used in a relative sense and imply the necessity of considering not merely the opinions of medical men but all the facts, before attempting to decide. In other words, the court's conclusion is that the statute should be construed to mean that the workman's right to compensation is to be suspended if he refuses to submit to an operation to which an ordinarily reasonable man would submit if similarly situated. Usually, the conduct of a workman is a question of fact to be decided by the triers of the facts. Each case will depend largely on its own facts and circumstances. If, in a given case, it can be said that the workman is refusing to undergo a safe and simple operation, which, if performed by a competent surgeon, is fairly certain to result in removal of the disability and is not attended by serious risk or extraordinary pain, and one to which an ordinarily prudent and courageous person would submit for his benefit and comfort, no question of compensation being involved, then it can be said that the continued disability of the workman is the direct result of his own unreasonable refusal.

In the present case, a plank gave way causing the workman's left knee to strike against a piece of steel, producing what was finally determined to be a floating semilunar cartilage of the knee joint. The commission, guided by the opinions of the physicians, apparently on the theory that the opinions of the medical men were conclusive, especially when they agreed, as they did here, that an operation was advisable, refused to make an award for an alleged permanent partial disability, on account of the refusal of the injured workman to submit to an operation. But a jury found that he had reasonable ground for the refusal, and on the verdict the circuit court adjudged him entitled to an award of 75 per cent. disability for the loss of function of the left knee and the left knee joint; which judgment is affirmed by the supreme court, the operation required being a major one and there being a risk of producing a result which some persons might deem worse than the man's condition without the operation.

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State of, Birmingham, April 20-23. Dr. H. G. Pern, Montgomery, Secretary.
American Association of Genito-Urinary Surgeons, Washington, D. C., May 2-3. Dr. R. F. O'Neil, 374 Marlborough St., Boston, Secretary.
American Ass'n of Pathologists and Bacteriologists, Washington, D. C., May 2-4. Dr. H. T. Karsner, Lakeside Hospital, Cleveland, Secretary.
American Association of Physicians, Washington, D. C., May 2-4. Dr. Thomas McCrae, 1627 Spruce St., Philadelphia, Secretary.
American Bronchoscopic Society, Washington, D. C., May 3. Dr. Samuel Iglauer, 701 Race St., Cincinnati, Secretary.
American Climatological and Clinical Association, Washington, D. C., May 2-4. Dr. Arthur K. Stone, Framingham Center, Mass., Secretary.
American Congress on Internal Med., Rochester and Minneapolis, April 3-8. Dr. Frank Smithies, 1002 N. Dearborn St., Chicago, Secretary.
American Dermatological Association, Washington, D. C., May 2-4. Dr. Udo J. Wile, University of Michigan, Ann Arbor, Secretary.
American Gastro-Enterological Association, Washington, D. C., May 1-2. Dr. Arthur F. Chace, 525 Park Ave., New York, Secretary.
American Gynecological Society, Washington, D. C., May 1-3. Dr. A. H. Curtis 104 S. Michigan Ave., Chicago, Secretary.
American Laryngological Association, Washington, D. C., May 1-3. Dr. George M. Coates, 1811 Spruce St., Philadelphia, Secretary.
American Laryng., Rhinol. and Otological Society, Washington, D. C., May 4-6. Dr. W. H. Haskin, 40 E. 41st St., New York, Secretary.
American Neurological Association, Washington, May 2-3. Dr. Frederick Tilney, 22 E. 63d St., New York, Secretary.
American Ophthalmological Society, Washington, D. C., May 1-3. Dr. T. B. Holloway, 1819 Chestnut St., Philadelphia, Secretary.
American Orthopedic Association, Washington, D. C., May 2-4. Dr. De Forrest P. Willard, 1630 Spruce St., Philadelphia, Secretary.
American Otological Society, Washington, D. C., May 2-3. Dr. Thomas J. Harris, 104 E. 40th St., New York, Secretary.
American Pediatric Society, Washington, D. C., May 1-3. Dr. H. C. Carpenter, 1805 Spruce St., Philadelphia, Secretary.
American Psychopathological Association, Washington, D. C., May 1. Dr. Sanger Brown, 2d, 118 E. 80th St., New York, Secretary.
American Society of Tropical Med., Washington, D. C., May 2. Dr. B. H. Ranson, Bureau of Animal Industry, Washington, D. C., Secretary.
American Surgical Association, Washington, D. C., May 2-4. Dr. John H. Gibbon, 1608 Spruce St., Philadelphia, Secretary.
American Therapeutic Society, Washington, D. C., May 1-2. Dr. Lewis H. Taylor, The Cecil, Washington, D. C., Secretary.
Congress of Amer. Phys. & Surgs. of North America, Washington, D. C., May 2-3. Dr. W. R. Steiner, 646 Asylum Ave., Hartford, Conn., Sec.
Georgia, Medical Association of, Columbus, May 3-5. Dr. Allen H. Bunce, Healy Building, Atlanta, Secretary.
Kansas Medical Society, Topeka, May 3-4. Dr. J. F. Hassig, 800 Minnesota Ave., Kansas City, Secretary.
Louisiana State Medical Society, Alexandria, April 11-13. Dr. P. T. Talbot, 1551 Canal St., New Orleans, Secretary.
Maryland, Medical and Chirurgical Faculty of, Baltimore, April 25-27. J. A. Chatard, 1211 Cathedral St., Baltimore, Secretary.
National Tuberculosis Association, Washington, D. C., May 4-6. Dr. George M. Kober, 370 Seventh Ave., New York, Secretary.
Nebraska State Medical Association, Omaha, April 24-27. Dr. R. B. Adams, 1013 Terminal Building, Lincoln, Secretary.
New Mexico Medical Society, Gallup, April 28-29. Dr. J. W. Elder, Santa Fe Hospital, Albuquerque, Acting Secretary.
New York, Medical Society of the State of, Albany, April 18. Dr. E. L. Hunt, 17 W. 43d St., New York, Secretary.
North Carolina, Medical Society of the State of, Winston-Salem, April 25-27. Dr. L. B. McBrayer, Sanatorium, Secretary.
Ohio State Medical Association, Cincinnati, May 2-4. Mr. Don K. Martin, 131 East State St., Columbus, Executive Secretary.
South Carolina Medical Association, Rock Hill, April 18-19. Dr. Edgar A. Hines, Seneca, Secretary.
Tennessee State Medical Association, Memphis, April 11-13. Dr. Olin West, 327 Seventh Avenue, N., Nashville, Secretary.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Anatomy, Philadelphia

January, 1922, **30**, No. 1

Certain Features of Spermatogenesis in Amphibia and Insects. R. H. Bowen, New York.—p. 1.
Reticular Material as an Indicator of Physiologic Reversal in Secretory Polarity in Thyroid Cells of Guinea-Pig. E. V. Cowdry, New York.—p. 25.
Endothelium in Tissue Culture. W. H. Lewis, Baltimore.—p. 39.
Development of Anterior Lymphatics and Lymph Hearts in Anuran Embryos. O. F. Kampmeier, Chicago.—p. 61.
*Disturbances in Mammalian Development Produced by Radium Emanation. H. J. Bagg, New York.—p. 133.

Effect of Radium on Mammalian Development.—The marked selective action of radium emanation on fast growing embryonic structures was noted by Bagg. Very decided developmental arrests occurred in the differentiation of the nervous and reproductive systems of mammalian embryos exposed to irradiation toward the end of pregnancy. Radium emanation, used either in the form of a radioactive solution injected into the adult female, or employed as an external gamma ray radiation, produced marked areas of extravasation in the subcutaneous connective tissue of the developing young. This suggests that the action of radium emanation might be selective on the endothelium of blood vessels. Extravasations occurred in the developing young of females treated with radioactive solutions a considerable time before fertilization, and suggest that in some way the faculty of the later developing embryos to form proper blood vascular endothelium had been interfered with. When women are subjected to therapeutic irradiation, especially during the early stages of pregnancy, the clinician should be forewarned concerning the possibility of producing very grave disturbances in the developing child.

American Review of Tuberculosis, Baltimore

January, 1922, **5**, No. 11

Nutrition of Acid Fast Bacteria. E. R. Long, Chicago.—p. 857.
*Dietary Requirements in Pulmonary Tuberculosis. W. S. McCann, New York.—p. 870.
*Intravenous Injection of Calcium Chlorid in Treatment of Intestinal Tuberculosis. P. H. Ringer and C. L. Minor, Asheville, N. C.—p. 876.
Respiratory Organs in Health and Disease. IV. Comparison of Vital Capacity Readings and Roentgen-Ray Findings in Pulmonary Tuberculosis. J. A. Myers, Minneapolis.—p. 884.
*Griffith Method for Direct Isolation of Tubercle Bacilli. H. W. Lyall, Pittsburgh.—p. 899.
Dissemination of Bacteria in Upper Air Passages. I. Circulation of Foreign Particles in Mouth. A. L. Blomfield, Baltimore.—p. 903.
Resistance to Tuberculosis and Its Relation to Antituberculosis Measures. A. K. Krause, Baltimore.—p. 915.

Dietary Requirements in Pulmonary Tuberculosis.—High protein diets, McCann asserts, greatly increase the metabolism and consequently enlarge the demands on the cardiorespiratory mechanism. They produce undesirable effects on the digestive and excretory systems as well. While nitrogen balance may be attained on a low protein diet, this is only possible when the protein metabolism is spared by an excessive ingestion of nonprotein food, chiefly carbohydrate. The effect of a carbohydrate rich diet is to increase greatly the breathing volume. Fat, which is metabolized with the greatest economy of respiratory function, is not so efficient as carbohydrate in sparing protein. Satisfactory nutrition may be attained by the use of moderate quantities of protein, from 60 to 90 gm. per diem, with the use of fat up to the limits of digestive capacity, and sufficient carbohydrate to bring the total caloric value of the diet to 2,500 or 3,000 calories. Such a diet will produce the least demand on the function of the damaged lungs. From the standpoint of diminishing the specific dynamic effects of foods, there is an advantage in dividing the diet into more than three meals.

Calcium Chlorid in Intestinal Tuberculosis.—Ringer and Minor report the results obtained in the treatment of thirty cases of tuberculous diarrhea by the more or less frequent intravenous injection of from 5 to 10 c.c. of a 5 per cent. calcium chlorid solution. Great care must be taken that none of the solution escapes into the subcutaneous tissue, as it is very irritating, causes excruciating pain, and may set up an area of necrosis and gangrene. Of sixteen cases receiving two injections each, thirteen showed absolutely no benefical effects therefrom and the drug was consequently discontinued. Two patients receiving two injections each showed decided improvement, which has continued and consequently no further injections have been given. One patient, receiving two injections at an interval of two months, was relieved of all symptoms and has not needed another dose. The authors are convinced that calcium chlorid will frequently palliate and relieve, and when cases are diagnosed early, may even prove curative. The results presented are not brilliant, but, their significance is such as to encourage further use of the drug.

Isolation of Tubercle Bacilli by Griffith Method.—In fifty-five out of fifty-six specimens tubercle bacilli were isolated by Lyall in pure culture by the Griffith direct method. The most uniformly successful medium for the direct isolation of tubercle bacilli from sputum was one containing beef liver infusion in the proportion of one part infusion to four parts of egg.

Archives of Internal Medicine, Chicago

February, 1922, **29**, No. 2

*Tracheal and Bronchial Stenosis as Causes for Emphysema. C. F. Hoover, Cleveland.—p. 143.
*Microlymphoidocytic Leukemia; Report of Case. S. Fineman, Minneapolis.—p. 168.
*Intracutaneous Reactions in Lobar Pneumonia. G. H. Bigelow, Boston.—p. 221.
Clinical Studies on Respiration. VIII. Relation of Dyspnea to Maximum Minute-Volume of Pulmonary Ventilation. C. C. Sturgis, F. W. Peabody, F. C. Hall and F. Fremont-Smith, Jr., Boston.—p. 236.
Position and Activities of Diaphragm as Affected by Changes of Posture. R. D. Adams and H. C. Pillsbury, Washington, D. C.—p. 245.
*Auriculoventricular Rhythm and Digitalis. H. B. Richardson, New York.—p. 253.
*Case of Disseminated Miliary Tuberculosis in Still-Born Fetus. R. C. Whitman and L. W. Greene, Boulder, Colo.—p. 261.
Convenient Electrode for Experimental Electrocardiographic Work. C. S. Williamson, Rochester, Minn.—p. 274.

Tracheal and Bronchial Stenosis as Causes of Emphysema.—Though active expiratory compression of the lung is rarely employed, the vigor with which the expiratory muscles can compress the lungs, Hoover asserts, is greater than that with which the inspiratory muscles can distend them. Therefore, the air inspired within a given time can be expired within the same time, provided the resistance in the trachea or the branches of the bronchial tree is the same in inspiration as in expiration. When the tracheal or uniform bronchial resistance to expiration exceeds that to inspiration, the residual air in the lung is increased only when hyperpnea attains such a degree that the respiratory need will not allow adequate time for the volume of the expired air to equal that of the inspired air. Compression of the lungs in expiration does not produce a vicious cycle of increasing resistance to expiration. Neither hyperpnea nor an active expiration is essential for the production of emphysema. Prolongation of expiration in emphysema does not measure the degree of expiratory resistance, but indicates the patient's respiratory tolerance of prolongation of the expiratory phase. It is only in the extremity of respiratory needs that active expiration is employed to overcome expiratory resistance. In bronchiolar spasm severe enough to demand an active expiration, the inspiratory and expiratory phases have the same duration, and the volume flow within each phase is constant. That an excess of expiratory over inspiratory resistance should produce emphysema, the excess must be unequally distributed in the bronchial tree.

Microlymphoidocytic Leukemia.—Fineman is of the opinion that his case offers strong evidence that the unitarian theory of the origin of white blood cells is the correct one. In his case the blood, at all times, showed numerous stem cells of all sizes. These cells (atypical) had a basophilic cytoplasm and a nucleus in which the chromatin formed a very fine evenly distributed sievelike network. Morphologically, they were indistinguishable from typical myeloblasts. The biopsy

of a lymph node showed these atypical cells proliferating in great numbers in the capsule, interfollicular tissue, lymph cords, lymph follicles and in the germ centers of the lymph follicles. Transition forms between the connective tissue cells of the capsule and these atypical cells, as well as between lymphocytes and these atypical cells also, were present. From the evidence at hand Fineman believes the conclusion is justified that in all probability the majority of the "myeloblasts" and "micromyeloblasts" of the blood were coming from the lymphoid organs, not only from the portions which, according to the dualists, may give rise to myeloid cells, but from the sanctum sanctorum of the lymphoid tissues, namely, the follicles and germ centers.

Intracutaneous Reactions in Lobar Pneumonia.—Of 104 cases of lobar pneumonia tested by Bigelow eleven gave one or more intracutaneous reactions to only one type of pneumococcus used, while forty-six reacted to two or more types. Of twenty controls none showed the single type reaction, while nine showed the multiple type reactions. In 10 per cent. of the cases treated with Type I antipneumococcus serum, specific type reactions were obtained, and in 14.8 per cent. not so treated there were similar reactions. No one of the fixed types showed any marked preponderance of specific type reactions. With antigens prepared from simple saline suspensions of pneumococci, 61.1 per cent. of the tests, performed on the patients showing the specific type reactions, were positive when the antigen used had been autolyzed in the incubator for a week or more, and 11.1 per cent. of the tests with nonautolyzed antigen were positive. No reactions comparable to those reported by Weiss and Kolmer with their "pneumotoxin" were obtained with a similar preparation, nor was there any specific absence of reactions as might be expected from an analogy to the Schick test.

Digitalis Causes Auriculoventricular Rhythm.—A case is described by Richardson in which clinical and pathologic observations combined to indicate a causal relation between the administration of digitalis and auriculoventricular rhythm.

Miliary Tuberculosis in Stillborn Fetus.—A case of transplacental infection is reported by Whitman and Greene. The diagnosis is firmly established by the character of the histologic changes, and the finding of tubercle bacilli in the kidney. The fact of stillbirth at term precludes intrapartum infection.

Archives of Occupational Therapy, Baltimore

February, 1922, **1**, No. 1

Arkansas Medical Society Journal, Little Rock

February, 1922, **18**, No. 9

Boston Medical and Surgical Journal

Jan. 19, 1922, **186**, No. 3

Operative Treatment of Epilepsy.—In three cases of jacksonian epilepsy and eleven cases of general epilepsy Little did a decompression operation which he believes was justified by the relief given thereby in many of the cases.

Feb. 16, 1922, **186**, No. 7

Heart in Hyperthyroidism.—From personal examination of a large number of hearts in hyperthyroidism Hamilton is convinced that the great majority of hearts present no evidence of damage. Heart failure is not found in this class of cases—even when death occurs. Hyperthyroidism in the presence of (*a*) rheumatic heart disease or (*b*) middle age (over 45 years) has a tendency to cause established or paroxysmal auricular fibrillation. In many cases of hyperthyroidism showing auricular fibrillation, the auricular fibrillation disappears after relief of hyperthyroidism by operative measures, while digitalized. Cases with auricular fibrillation without true signs of heart failure have stood operation well. All auricular fibrillation cases with hyperthyroidism can be improved by digitalization. It is suggested that digitalization has a favorable influence on the cure of auricular fibrillation in hyperthyroidism.

Florida Medical Association Journal, St. Augustine and Jacksonville

January, 1922, **8**, No. 7

Journal of Immunology, Baltimore

January, 1922, **7**, No. 1

Virulence of Meningococci.—It would appear from the observations made by Heist and the Cohens that so far as the resisting power of the blood is concerned the susceptibility of men, in general, to meningococcic infection is quite low. Meningococci from the spinal fluid are much more virulent for man than are the majority of the strains of meningococci which inhabit the throats of carriers. Some carrier strains are more virulent than others. Among those who have been in contact with a case of meningitis the percentage of carriers is sometimes very high, from 8 to 12 per cent. When meningococci, freshly isolated from the spinal fluid of a patient with cerebrospinal meningitis, are cultivated in capillary tubes of the whole coagulable blood of normal men, they are found to possess an ability to grow rapidly in that medium. This ability is not possessed by the majority of the strains of meningococci freshly isolated from the throats of carriers. Experiment has proved that there is a correlation between the ability of the meningococci (as well as certain other bacteria) to grow rapidly in whole coagulable blood and their virulence for the species from which the blood was taken. The spinal fluid strains of meningococci are much more virulent for man than are the carrier strains. Certain carrier strains grow better in whole coagulable human blood than do others. They are the more virulent for man. The majority of carrier strains are relatively low in virulence or are nonvirulent. The whole, coagulable blood of most normal men will permit the rapid growth of spinal fluid strains. This indicates that most men are susceptible to the attacks of meningococci that have passed through the human nervous system. The blood of but one among many normal men permits the rapid growth of carrier strains. This minority of men is more likely to develop meningitis after exposure to a carrier. It is probably among this group that most of the cases of meningitis occur.

Allergic Reaction of Tuberculous Uterine Horn.—The experiments recorded by Smith are an application of the principle of specific reactivity between antigen and its homologous antibody, employing the sensitive uterus as an indicator. A series of tests were performed in which the uterine horn of the tuberculous pig was suspended by the Schultz-Dale method, and to the bath solution urine from

different sources was added. The reactions obtained were extremely varied in character. With supposedly normal urines, as a rule, no reactions were secured with the amounts of urine employed; with urine from persons reported to have tuberculosis clinically, reactions were sometimes absent and at other times extremely sharp and analogous in every respect to the acute anaphylactic response. Tests were conducted by suspending a uterine horn from a tuberculous guinea-pig and a horn from a normal guinea-pig in the same bath of oxygenated Locke solution. After relaxation of the horns and the appearance of the regular rhythmic contractions, the urine from a case of tuberculosis was added to the bath solution (350 c.c.), usually from 3 to 5 c.c. In no instance has this amount of urine from any case induced a marked reaction in the normal horn while in some cases the tuberculous horn responded sharply. With seven of eight urines from known cases of tuberculosis, reactions of the tuberculous horn have been secured of greater or less intensity as compared with normal tissue.

Diphtheria Bacillus Toxin-Antitoxin Relationship.—Pawson and Redowitz were unable to confirm the contention that Group II, *B. diphtheriae*, toxin is not neutralized by standard antitoxin to the same extent as Group I toxin. The results of their experiments, which are reported in full, lead them to the conclusion that diphtheria antitoxin as produced by the injection of toxin obtained from Group I strains neutralized equally well the toxins produced by either Group I or Group II organisms. One, one and a half, and two units of standard antitoxin injected simultaneously with large doses of virulent cultures, protect guinea-pigs against both types of *B. diphtheriae*.

Journal of Medical Research Boston

Oct.-Dec. 1921, **42**, No. 5

Experimental Production of Functional Hypertrophy in Nerve Cell. W. D. Collier, Columbia, Mo.—p. 439.
Effect of Stored Glycogen on Autolysis of Liver Tissue. J. P. Simonds, F. H. Reuling and H. H. Hart, Chicago.—p. 455.
*Experimental Pigment Cirrhosis Due to Copper and Its Relation to Hemochromatosis. F. B. Mallory, F. Parker, Jr., and R. N. Nye, Boston.—p. 461.
*Heterotransplantation of Lens and Cornea. M. S. Fleisher, St. Louis. —p. 491.
Purification and Concentration by Desiccation of Hog Cholera Immune Serum. C. W. Duval and M. Couret, New Orleans.—p. 503.
Cloudy Swelling a Process of Stimulation. A. Davidman and D. H. Dolley, Columbia, Mo.—p. 515.

Hemachromatosis of Liver Due to Copper.—Chronic poisoning with salts of copper produces in the livers of rabbits in six months to a year a series of changes comparable in many ways with those found in the liver in a chronic disease in man known as hemochromatosis. The present extensive use of crude distilling apparatus in consequence of prohibition is likely to lead to an increase in the number of cases of hemochromatosis if the disease is due to chronic poisoning with copper.

Heterotransplantation of Lens and Cornea.—Fleisher found that the epithelium of the heterotransplanted lens survives in a state of good preservation for from twelve to fourteen days, while epithelium of the homoiotransplanted lens survives even as long as forty-two days. The epithelium of the heterotransplanted cornea survives only for about ten or fourteen days and shows marked degeneration before this time, while the epithelium of homoiotransplanted cornea survives even at the thirty-fifth day.

Journal of Metabolic Research, New York

January, 1922, **1**, No. 1

*Experimental Studies in Diabetes. Series III. Pathology of Diabetes. 1. Hydropic Degeneration of Islands of Langerhans After Partial Pancreatectomy. F. M. Allen, New York.—p. 5.
*Id. 2. Granule Stains of Islands of Langerhans of Diabetic and Nondiabetic Pancreas. W. B. Martin, New York.—p. 43.
Id. 3. Nervous Influences in Etiology of Experimental Diabetes. F. M. Allen, New York.—p. 53.
Id. 4. Rôle of Hyperglycemia in Production of Hydropic Degeneration of Islands. F. M. Allen, New York.—p. 75.
*Id. 5. Influence of Circulatory Alterations on Experimental Diabetes. F. M. Allen, New York.—p. 89.
Experiments on Carbohydrate Metabolism and Diabetes. 4. Dextrose-Nitrogen Ratios in Partially Depancreatized Dogs. F. M. Allen and M. B. Wishart, New York.—p. 97.
*Id. 5. Influence of Glucose Ingestion on Diuresis and Blood Composition in Nondiabetic and Diabetic Persons. J. W. Sherrill and H. J. John, Morristown, N. J.—p. 109.

Hydropic Degeneration of Islands of Langerhans in Diabetes.—Allen asserts that the hydropic degeneration of the islands of Langerhans is proved to be a specific diabetic phenomenon, produced solely by overstrain of the function of the cells by diets in excess of the weakened assimilative power. The rate of the anatomic change varies with the clinical condition, but with unchecked severity of diabetes a period of from four to seven days in generally required for development of the first positive vacuolation; maximum vacuolation may be attained in about a month; and in from six weeks to two months all beta cells may have disappeared from the pancreas. The hydropic change is probably reversible within certain limits, and even widely vacuolated cells may probably recover their former size and granulation, provided the cell membrane has not burst or the nucleus become too badly degenerated. The formation of numerous strands and heaps of duct cells, and the vacuolation of these and the epithelium of the smaller ducts, are described for the first time in the end stages of severe experimental diabetes. The significance of this phenomenon is hypothetic, but it may represent the exhaustion of a proliferative rather than of an endocrine activity. The existence of "total" diabetes from the standpoint of carbohydrate metabolism after the complete exhaustion or disappearance of the beta cells, though the alpha cells survive and retain full granulation, indicates that the beta cells alone furnish the internal secretion which is concerned in the sugar economy. The differences that still exist between such an animal and a totally depancreatized animal furnish evidence, first, that the profound cachexia following total pancreatectomy is not due solely to the failure of carbohydrate metabolism or the hyperglycemia or glycosuria resulting from this failure; and second, that the alpha, duct, acinar or other cells of the pancreas furnish an unknown internal secretion which is somehow important for the welfare of the organism. The demonstration of the nature of the hydropic change Allen asserts is important for the following reasons: Its presence affords a positive microscopic diagnosis of active diabetes. It completes the proof of the island theory of diabetes. It adds to the evidence of the essential identity of experimental and clinical diabetes. It explains the permanent lowering of assimilation in diabetes consequent on excessive diets. From a broader physiologic standpoint, it offers the only proved example of anatomic breakdown of cells due to overstimulation of an internal secretary function.

Granule Stains of Islands of Langerhans.—The results obtained from the application of special methods of staining to human diabetic material Martin says have not been conclusive. While these methods, by clearly revealing all tissue of island character, have confirmed the quantitative deficit of island tissue in certain cases of human diabetes; in other cases, however, where the routine stains show large numbers of normal appearing islands with or without hydropic changes in a few, the special stains may also reveal the usual proportion of alpha and beta cells with apparently normal granule contents.

Influence of Circulatory Alterations on Experimental Diabetes.—By operative methods Allen was able to reduce the arterial supply or the venous drainage of pancreas remnants to a considerable extent, or to increase the arterial circulation to at least a slight extent. All these circulatory changes failed to alter the assimilative function or the pancreatic structure in any way. In particular, they failed to produce vacuolation, "atrophy," fibrosis or any other specific island changes. The experiments therefore throw no light on the pathology of diabetes and afford no support for any circulatory or vasomotor theory of the etiology.

Effect of Glucose Ingestion on Diuresis and Blood Composition.—Sherrill and John state that glucose ingestion produces hyperglycemia attended with oliguria in normal and in many diabetic subjects. The accompanying fall in hemoglobin, red cell volume and to a less degree in red cell counts indicates a probable hydremic plethora at the same

time, or, at least, serves to rule out any concentration of the blood rather definitely. The usual fall in the plasma chlorid concentration is further evidence in favor of a retention of water in the blood or tissues or both. Emphasis is laid on the apparent dilution of the blood during the period of hyperglycemia and oliguria in all typical cases. It thus seems possible definitely to exclude the assumption that the oliguria is due to concentration of the blood through the osmotic withdrawal of water from it by the glucose in the intestine. Another easy assumption has been that glucose acts as a diuretic by its osmotic influence in the kidney. It might, thus, conceivably increase the quantity of glomerular filtrate, or cause water excretion through the tubules, or prevent resorption of water in the tubules, according to the theory of renal function adopted. The experimental facts contradict this assumption, inasmuch as oliguria is typically just as pronounced, or even more so, when there is marked glycosuria in addition to hyperglycemia and hydremia. Thus, in one case oliguria existed with 2.86 per cent. glycosuria. In a minority of the diabetic cases, especially of the severe group, glucose lacked antidiuretic influence and even served as an active diuretic, producing polyuria with or without hydremia. In no cases was the diabetes "total." Only a part of the glucose administered was either excreted during the experimental period or retained in the blood, so that proof is thus afforded of a partial retention of power either to utilize sugar or at least warehouse it in the tissues. No theoretical explanation of these differences is given.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

February, 1922, **19**, No. 1

*Action of Diphtheria Toxin on Circulation. S. Yabe, Edinburgh.—p. 1.
*Stimulation of Respiration: Action of Respiratory Stimulants on Respiration When Depressed by Increased Intracranial Pressure, with Special Reference to Sodium Cyanid. A. S. Loevenhart, J. Y. Malone and H. G. Martin, Madison, Wis.—p. 13.
Resistance of Rat to Consecutive Injections of Strychnin. E. W. Schwartze, Washington, D. C.—p. 49.
Action of Drugs on Output of Epinephrin from Suprarenals. VIII. Morphin. G. N. Stewart and J. M. Rogoff, Cleveland.—p. 59.
Influence of Muscular Exercise on Normal Cats Compared with Cats Deprived of Greater Part of Suprarenals, with Special Reference to Body Temperature, Pulse and Respiratory Frequency. G. N. Stewart and J. M. Rogoff, Cleveland.—p. 87.
Influence of Morphin on Normal Cats and on Cats Deprived of Greater Part of Suprarenals, with Special Reference to Body Temperature, Pulse and Respiratory Frequency and Blood Sugar Content. G. N. Stewart and J. M. Rogoff, Cleveland.—p. 97.

Action of Diphtheria Toxin on Circulation.—Yabe noted that the effects of diphtheria toxin on the circulation and respiration only appear many hours after its injection, even when a dose that is many times that ultimately fatal is injected intravenously. All attempts to analyze its action in acute experiments are, therefore, futile, and further light can be thrown on its effects only by examining the condition of animals subjected to it many hours previously and comparing their symptoms with those of controls. In a series of such experiments the blood pressure was found to be lower than in the controls, and this appeared to be due to failure of the central vasomotor mechanism. No evidence of direct action on the peripheral vasoconstrictor nerves, or on the vessels of the heart, was obtained.

Stimulation of Respiration by Sodium Cyanid.—Sodium cyanid is the most reliable stimulant to the respiration when depressed by increased intracranial pressure, according to Loevenhart et al. It exercises its stimulating action on the respiratory center directly and acts independently of any change which it produces in the circulation. The changes in the blood pressure following therapeutic doses of sodium cyanid are insignificant. The effects of sodium cyanid last but a very brief period, usually not over one minute, but occasionally stimulation may last as long as thirty minutes. Stimulation of the respiration following single injections of cyanid may be repeated at will. By giving cyanid continuously at the proper rate, continuous stimulation of the respiration may be maintained for hours. Sodium cyanid must be administered intravenously. No other method of giving the drug is at all satisfactory. The dosage of sodium cyanid for stimulation of the respiration in the dog by single injections is from 1 to 3 mg. The dosage for continuous injection to maintain an already established stimulation is approximately 0.25 mg. (0.5 c.c. of a hundredth normal solution) per minute. Strychnin sulphate, given intravenously, stimulated the respiration in from 25 to 50 per cent. of the experiments. The stimulation of the respiration by strychnin is not so prompt or reliable as in the case of sodium cyanid, but the stimulation following a single dose of strychnin lasts much longer than in the case of the cyanid. Atrophin sulphate was found to be a most unreliable respiratory stimulant. In some cases, brief but definite stimulation of the respiration by caffein citrate was noted. Lactic acid in most cases had no stimulating action.

Journal of Urology, Baltimore

December, 1921, **6**, No. 6

*Perineal Prostatectomy; Detailed Study of One Hundred Consecutive Cases. A. B. Cecil, Los Angeles.—p. 399.
*Suprapubic Versus Perineal Prostatectomy; Comparative Study of Ninety Perineal and Thirty-Eight Suprapubic Cases. F. Hinman, San Francisco.—p. 417.
Experiences with Radium in Cancer of Prostate. H. G. Bugbee, New York.—p. 459.

Perineal Prostatectomy.—Young's procedure has been carried out in every one of the one hundred cases analyzed by Cecil. No cases of perineal fistula occurred in the entire series. Of eighty-eight benign case in men who recovered from the operation and who were discharged from the hospital only when their wounds were closed, and urination had been definitely established, none has had retention of urine. One case of permanent incontinence occurred, which is explained by the fact that this man had previously had an operation for stricture, and in this way the external sphincter muscle had been destroyed. The prostatectomy mortality rate was 2 per cent., and this percentage is based on complete closure of the wound, and restoration of function. The two deaths occurred in hemiplegics who were at least 80 years of age. Both men died on the fourteenth day from pneumonia.

Perineal Prostatectomy Preferred.—A very detailed analysis of a large number of cases made by Hinman leads him to conclude that Young's method of perineal prostatectomy is superior to the Fuller-Freyer method of suprapubic prostatectomy. The fatalities have been surprisingly few and due to avoidable accidents. The functional results, even in earlier cases, are unusually good in view of the advanced and complicated conditions treated. The general results are much better than those obtained suprapubically. The cure cannot fail of being just as lasting and permanent.

New York Medical Journal

Feb. 15, 1922, **115**, No. 4

Angina Pectoris. C. Allbutt, London.—p. 181.
Significance of Peripheral Resistance in Circulatory Disturbances. W. Russell, Edinburgh.—p. 188.
Relation of Peripheral Circulation to Diseases of Heart. J. Barr, Liverpool.—p. 190.
Facies in Mitral Stenosis and Aortic Regurgitation. S. Russell-Wells, London.—p. 196.
Meaning of Tachycardia in Relation to Mechanism of Responses of Heart. R. McN. Wilson, London.—p. 200.
Premature Contraction and Its Significance. J. Strickland-Goodall, London.—p. 204.
Cardiovascular Disorders Produced by Disease in Digestive Tract. N. Mutch, London.—p. 206.
Heart in Chronic Pulmonary Tuberculosis. A. Latham, London.—p. 209.
Paroxysmal Tachycardia. F. W. Price, London.—p. 212.
Infective Endocarditis. B. Parsons-Smith, London.—p. 215.
Relationship of Precordial Distress to Extracardiac Conditions. E. C. Reifenstein, Syracuse, N. Y.—p. 219.
Cardiac Index of Goiter. A. E. Renner, New York.—p. 223.
Estimating Intrapericardial Pressure. G. A. Stephens, London.—p. 225.

Texas State Journal of Medicine, Fort Worth

February, 1922, **17**, No. 10

Principles of Cardiology. C. M. Grigsby, Dallas.—p. 471.
Treatment of Hypertension. C. T. Stone, Galveston.—p. 475.
Treatment of Cardiac Decompensation. A. E. Greer, Houston.—p. 479.
Etiology and Diagnosis of Renal Hematuria. H. R. Dudgeon, Waco.—p. 482.
Kidney and Ureteral Calculi. A. O. Singleton, Galveston.—p. 486.
Treatment of Impassable Strictures of Urethra by Combined Suprapubic Cystotomy and External Urethrotomy. F. Pascha, San Antonio.—p. 489.
Albuminuric Retinitis. J. J. Crume, Amarillo.—p. 491.

U. S. Naval Medical Bulletin, Washington, D. C.

February, 1922, **16**, No. 2

Size of Normal Heart.—Owing to great and unexplained variability of the heart, Smith and Bloedorn assert that there will always be difficulty, whatever means be used, to ascertain the size of the individual heart under observation. Hence, any conclusion as to the relative size of a heart based on comparative dimensions, ratios or relations to body landmarks is fallacious and should be applied clinically with great reserve.

Recurrence of Hydatid Disease.—Norburn relates the case of a man who early in 1918 had an attack of acute generalized abdominal pain for which a laparotomy was performed. The appendix and a cyst of the liver were removed. He has never been real well since. He entered the hospital again in January, 1921, complaining of nervousness and a tumor rather hard, smooth in outline and about the size of a hen's egg, in the abdominal wall behind the right rectus muscle just above the umbilical level and close to the midline. No sense of fluctuation or hydatid fremitus could be made out. The spleen was enlarged, extending about two fingers below the costal margin. The eosinophils were only 1 per cent. At the operation the tumor was found to be behind the posterior rectus sheath, bulging this structure forward. The tumor was tapped and a very clear, colorless fluid was drawn off. A cyst holding about a quart was found overlying the inner anterior aspect of the left kidney, attached to the posterior abdominal wall and to the intestines. Scattered about on the peritoneal wall of the bowel could be seen raised yellowish white spots about 0.5 cm. in diameter. Microscopic examination of the endocyst showed the scolices of echinococcus. This case shows how low the eosinophil count may be in hydatid disease, and, that the dissemination of the disease probably occurred from a rupture of the cyst at the time of the appearance of abdominal symptoms in January, 1918, or that it followed a soiling at the first operation. This emphasizes again the great importance of using, during operation, every precaution to prevent escape of the contents of an echinococcus cyst into the abdominal cavity.

Differentiation of Cowpox, Smallpox and Chickenpox.—Stalnaker has noted that when bodily eruption caused by cowpox vaccinations occurs, the eruption is never seen in the mucous membrane of the roof of the mouth (either the hard or the soft palate). If an eruption is present in the roof of the mouth it is certain not to be the result of cowpox vaccination. On the other hand, he has never seen a single case of either smallpox or chickenpox in the eruption stages in which an eruption was not present in the mucous membrane of the roof of the mouth.

Virginia Medical Monthly, Richmond

February, 1922, **48**, No. 11

Skin Tests in Bronchial Asthma and Hay-Fever.—From a review of the records of 100 patients on whom Hutcheson has made skin tests, the deductions as to the frequency with which positive reactions occur are approximately those published by others for asthma and hay-fever. There were seventy cases showing typical bronchial asthma, but twenty-two of these gave evidence, in addition, of one or more other conditions. Of these seventy cases, thirty-three, or 47 per cent., gave positive skin tests to one or more proteins. Seasonal hay-fever was the predominating complaint in eighteen cases, and sixteen of these gave positive skin tests, but nine showed also one or more of the other syndromes. The remainder of the cases consisted of urticaria, angioneurotic edema, eczema, perennial hay-fever, or combinations of these. Ten cases in which urticaria was the chief complaint gave positive tests in five, while of four cases of perennial hay-fever two gave positive reactions to proteins. The results of treatment in the sensitive cases were variable. As a rule, where the protein was definitely determined and the patient capable of intelligent and thorough cooperation, the results have been good. In a number of instances skin tests revealed multiple sensitization, and it was difficult to determine which protein was giving trouble. Hutcheson's cases showed that the earlier in life the symptoms begin, the more apt is the patient to prove sensitive to some known protein. In deciding to what substances an individual is sensitive skin tests are essential, but Hutcheson cautions that skin tests alone may be misleading, and like every other form of laboratory investigation must be checked carefully by an adequate history and examination of the patient.

Treatment of Chronic Pancreatitis.—Brown reports a case of this kind in which the absence of free hydrochloric acid and the early evacuation of the stomach contents indicated the use of hydrochloric acid in rather large doses. On the administration of hydrochloric acid with meals, the first improvement was noted. The diet was the next step. The food was made free of fat. Pancreatic extract was administered with lactate of calcium. The relief from the symptoms of frequent large oily and fatty bowel movements was marked. The patient's general improvement was immediate.

Recurring Volvulus of Colon with Megacolon.—Willis is of the opinion that if surgeons keep in mind the possibility of the occurrence of this condition, and in patients with a history of long continued, obstinate constipation where physical examination reveals a much distended abdomen, subject the patient to careful roentgenologic study, megacolon will be recognized even more frequently than it has been in the past.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Bristol Medico-Chirurgical Journal

December, 1921, **38**, No. 144

Journal of Laryngology and Otology, Edinburgh

February, 1922, **37**, No. 2

Lancet, London

Feb. 1, 1922, **1**, No. 5136

Faulty Food and Gastro-Intestinal Disorder.—This paper was published in THE JOURNAL, Jan. 7, 1922, p. 1.

Irradiated Tumor Cells Confer Immunity in Animals.—Experiments have been undertaken by Scott and Russ to obtain more information with a view to using irradiated tumor for the treatment of human cancer, and this paper gives the results obtained. The experimental results confirm and extend previous work on the immunity in animals to tumor growth which can be set up by irradiated tumor cells. If the processes controlling the growth of tumors in animals have an analogy in man, then these observations appear to have two bearings on the treatment of malignant disease. The first is that some degree of immunity may result from the adequate irradiation of a malignant tumor in the body, but to insure this in practice is generally of great technical difficulty. The second is that the treatment of a patient with irradiated tumor cells, after the surgical removal of the growth, may help to set up a state of resistance to the disease.

Immunizing Cancer Patients Against Their Own Tumor Cells.—Kellock, Chambers and Russ have been attempting to immunize patients suffering from cancer against their own tumor cells. The number of cases treated (thirty) is too small, and the time that has elapsed too short, to form an opinion of much value of the effect on the progress of the disease. In some of the cases the disease was very advanced, and in two there were probably visceral metastases at the time of treatment. Five patients with carcinoma of the breast, diagnosed by microscopic examination, were treated between November, 1920, and June, 1921. In all these a limited operation was performed, the primary growth only being removed and the axillary glands left, except in one case. When last seen (in January, 1922) these patients were all in good health, without evidence of recurrence. In reviewing these results it is stated that in almost all the cases the stage of the disease rendered any other form of treatment inadvisable. In view of the results of some of the more recent cases, it may be possible to improve on them by adopting the treatment earlier, before dissemination of the disease has occurred.

Serologic Test in Typhus.—Although the nature of the specific etiologic agent in typhus is still uncertain, and although no simple laboratory test apart from animal experiment is yet available for its recognition, nevertheless, Wilson says, the almost constant presence of heterologous agglutinins in the typhus patient's serum enables a laboratory diagnosis to be made with almost unerring accuracy at the end of the first week of the disease. These agglutinins act on a great variety of micro-organisms, but chiefly on intestinal bacilli; among the latter the strain of *B. proteus* isolated by Weil and Felix and named X 19 has been most employed for the purpose. When emulsions are made of such desiccated bacilli they can be for some weeks preserved with 0.1 per cent. liquor formaldehyd without their sensitiveness being impaired. These facts permit of preparing a stable sensitive diagnosticum and dispensing with living cultures, the advantage being obvious in military service in the field and also in allowing the use of an emulsion of known sensitiveness. It is well known that *B. proteus* X 19 in the living state is apt to vary as regards its agglutinability. Desiccation of bacilli renders them less agglutinable by specific serums, and to this rule *B. proteus* X 19 is no exception. It would therefore seem that the typhus serum agglutinins for X 19 are different from those produced in the blood of an animal by inoculation. Coliform, nonlactose fermenting bacilli are occasionally found in typhus urine and are agglutinated by the serums not only of the individual patient but of other patients. On one occasion a strain of *B. pyocyaneus* was isolated which was agglutinated by a few of the typhus serums.

National Medical Journal of China, Shanghai

December, 1921, **7**, No. 4

Plague in China.—Wu Lien Teh reports on a very extensive research made by him. Pneumonic plague epidemics arise as a secondary manifestation of bubonic plague. The prevalence of purely septicemic cases toward the end of the epidemic is significant as a probable explanation of its decline and termination. Subacute or chronic plague may exist among the tarabagans in Mongolia and Siberia, giving rise to periodical outbreaks of bubonic plague in man, as a result of direct infection from injury due to skinning by trappers or marmot eaters. The tarabagan is easily susceptible to pneumonic plague produced by inhalation of the *B. pestis* in spray form. The existence of pneumonic plague carriers has been proved in the 1921 Manchurian epidemic. Rooms in which patients have died of pneumonic plague are not particularly dangerous. In four instances recorded, sick patients traveling in railway cars have not infected their fellow passengers. Disinfectants and antiseptics, even in strengths above those usually employed, have very little effect on plague sputum. Alcohol is the surest means of sterilizing the hands and gloves in plague work. The author has cultivated plague bacilli from seemingly dry sputum of patients. the mask is the principal means of personal protection against pneumonic plague.

South African Medical Record, Cape Town

Jan. 14, 1922, **20**, No. 1

Cancer of Liver and Schistosomiasis.—This article was also published in the *Medical Journal of South Africa*, December, 1921, and was abstracted in THE JOURNAL, Feb. 18, 1922, p. 546.

Tubercle, London

February, 1922, **3**, No. 5

Pulmonary Tuberculosis and Intestinal Stasis.—The presence of amino-acid derivatives in the urine, Davies states, is an indication of intestinal stasis and of the invasion of the lower coils of the ileum by bacteria which normally should be localized to the large intestine. The presence of these amino-acid derivatives in the urine affords an indication, easily available, of the state of the intestinal tract at any period of time. Frequent examinations have enabled Davies to make what appear to him to be some extremely useful deductions as to the influence of intestinal stasis on the course of pulmonary tuberculosis, on the course of the complications of that disease and on the necessity of certain precautions during the treatment by operative measures. Two facts established were: (1) the great frequency of skatoxyl in patients suffering from tuberculosis of the lungs; (2) the ineffectualness of drugs to produce more than a temporary diminution of the sulphuric ethers, but the magic charm (though not infallible) as a temporary measure, of castor oil and of mercurous chlorid and of the extreme usefulness, in certain cases, of kaolin. Therefore, to treat tuberculosis of the lungs as an isolated lesion, leaving out all consideration of the gastro-intestinal tract, Davies says is to treat a part only of the disease.

New Sign in Pulmonary Tuberculosis in Children.—Alteration in the position of the scapula is described by Tinker as a new sign for the diagnosis of pulmonary tuberculosis in children. Loss of muscle tone is the cause of the malposition.

Archives des Maladies de l'App. Digestif, Paris

1922, **12**, No. 1

Cancer in Megesophagus.—Cade and Morenas have been able to find records of only one case like the one they report in which a cancer developed in the abnormally large esophagus. Their patient was a man of 29, and in both the cases the dilatation of the esophagus had allowed the malignant disease to develop without characteristic symptoms. In both cases the cancer was a necropsy surprise. In the man of 47, even the dilatation of the esophagus had not been recognized during life. The rapid loss of weight, 13 kg. in two months, might have suggested malignant disease.

Paralysis of Diaphragm with Gastric Ulcer.—In the four cases described, the old hard ulcer of the lesser curvature had entailed a subinflammatory process in adjoining tissues, which had finally reached the diaphragm and resulted in paralysis and then sclerosis of this half of the diaphragm. The process spreads from below like the downward process with pleurisy. In two of the cases, gastric functioning was restored to clinically normal by a gastro-enterostomy, but the paresis of the diaphragm was not modified. Discovery of paralysis of half of the diaphragm may aid sometimes in detection of a gastric ulcer.

Sigmoid Megacolon.—Miginiac relates that of 27 patients with acute ileus from megacolon above the sigmoid flexure, over 74 per cent. were cured by a prompt operation. Emergency resection, making an artificial anus at the spot, seems to offer the best prospects. Resection followed by immediate enterorrhaphy has occasionally given fine results. The artificial anus can be closed later at will. It is impossible to relieve a megacolon as if it were normal bowel, and purely palliative measures are futile. The 27 cases are tabulated, Pauchet having 6 to his credit with 4 recoveries; in one case cecostomy had proved useless, and resection of the sigmoid megacolon gave only temporary relief, but a permanent cure followed total colectomy. In his latest case, he resected the entire colon at once, to begin with, and the patient was cured immediately, but traction from the shriveling mesentery induced strangulation of the artificial anus loop later.

Archives de Médecine des Enfants, Paris

January, 1922, **25**, No. 1

Treatment of Malaria in Children.—Suzuki has been studying for years the best mode for administering quinin to children, and has decided that by the rectum absorption is more rapid than by other routes, while this avoids the drawbacks of other methods of giving quinin to children. His tables of the minimal fatal dose and concentration by the rectum for rabbits, and of the bactericidal action of different quinin salts are confirmed by the clinical charts in a typical series of cases of malaria in children. The data presented testify, he declares, that a 0.25 or 0.50 per cent. solution of quinin hydrochlorid given by the rectum is the most effectual method of administering quinin. He has applied it with conclusive results in treatment of tropical malaria at all ages in tropical regions, and commends it especially for treatment of children. In the cases he reports, a single rectal injection of 100 or 150 c.c. of the 0.25 per cent. solution cured the child completely, the malaria plasmodium disappearing from the blood and the spleen subsiding to normal size with no recurrence during the months to date.

Cirrhosis of Liver and Heart.—The necropsy of the girl of 10 confirmed the diagnosis of cirrhosis of the liver and heart of the Hutinel type, and revealed a large tuberculous nodule in the right auricle, but the lungs seemed to be intact. The foramen of Botalli was patent, which allowed a crossed embolism in the brain.

Congenital Rachitis Plus Osteomalacia.—The intense rachitis was followed by progressive softening of the bones, with fractures which did not heal. The child died from pneumonia at the age of 14 months.

Mikulicz' Disease in Children.—Comby gives the details of a case of Mikulicz' disease in a girl of 13. It had been mistaken for mumps at first. He analyzes the similar cases on record. In one, syphilis was evidently a factor, and the salivary and lacrimal glands subsided to normal size under specific treatment.

Bulletin de l'Académie de Médecine, Paris

Jan. 17, 1922, **87**, No. 3

Benefit from Vaccination Against Typhoid.—At Havre there were seventy-two cases of typhoid last fall but all were in women or children; only one case was known in a man, and in him the disease was attenuated. All the men in town had been vaccinated during the war.

Measurement of Surface Area.—Roussy comments on the important functions of the skin, and shows how to measure its area on the horse, as he has worked out the geometrical law for this anatomic metrostatics. He multiplies the average perimeter of the body by its average peripheral height. This requires records of at least 15 perimeters and 6 up-and-down lines, as he illustrates.

Bulletin Médical, Paris

Jan. 21, 1922, **36**, No. 4

Journal de Médecine de Bordeaux

Jan. 10, 1922, **94**, No. 1

Serotherapy of Mumps.—Mallié has compiled records of a large number of cases of mumps, mostly in soldiers, treated by injection of diphtheria antitoxin. All writers agree that it relieves the symptoms and shortens the course. The relief is so constant that the men asked for the injection at the slightest signs of orchitis. As a preventive, Salvaneschi stated that orchitis did not develop in any of his twenty-six cases thus treated, but others were less fortunate, so that there were nine cases of orchitis after the antitoxin treatment, in a total of 128 cases. The doses had been 20 c.c. up to 80 c.c. Others have tried normal horse serum, with the result of testicle complications in two of nine cases and one of primary mumps orchitis. Mallié treated seventy-four soldiers with mumps by intramuscular injection of a colloidal metal followed in half an hour with acetyl-salicylic acid internally. Orchitis developed in 15 per cent. but prompt relief and shortening of the course were pronounced. The results were thus the same as with the antitoxin. He remarks in conclusion that these experiences demonstrated at least the harmlessness of these methods, and he is convinced of their actual efficacy. On the basis of these experiences he applied the same treatment in 163 cases of measles, and was impressed with the brief and mild course, without bronchial complications.

Treatment of Malaria.—Grassetau outlines the combined tonic and antidyspepsia medication, to supplement the quinin, which he applied in 1,504 cases at the malaria hospital in his charge, and all seem to be permanently cured.

Journal de Radiologie et d'Electrologie, Paris

December, 1921, **5**, No. 12

Lyon Chirurgical

November-December, 1921, **18**, No. 6

Edematous Stumps.—Leriche refers to the swelling of a stump that has seemed to have healed normally, and even been fitted with a prosthesis. The edema is like a trophic ulcer, the active proliferation of the axis cylinders in the end-bulb of the distal stump, and their straggling in abnormal paths, start a vasodilating reflex which interferes with the normal nourishment of the tissues and aggravates existing disturbances. The aim in treatment is to excise the end-bulb and prevent its return. The best means for this seems to be to sever the nerve trunk some distance above, and then suture the ends together again at once. By this means the proliferating axis cylinders from the distal stump travel down the conduits in the peripheral stump instead of aimlessly straggling and setting up reflex irritation.

Femoral Hernia.—Piotrowski states that the U suture method he describes is extremely simple and an absolute cure. After the hernial sac has been opened, the bowel reduced and the sac ligated, a needle is passed from 2 or 3 cm. above Poupart's ligament down under Cooper's ligament, grazing the edge of the pubis and catching up the periosteum. The needle is then threaded with silk which is drawn through, and the needle is then introduced 1 cm. beyond, and the other end of the silk is drawn up. The U suture thus taken wards off danger of recurrence, he says, and the operation proved a complete success in 67.6 per cent. of the 108 cases in which it has been applied. There was strangulation in all but fifty-three cases. The harmlessness and efficacy of this technic encourage insistence on correction of femoral hernias before they reach the dangerous strangulation stage.

Paris Médical, Paris

Dec. 31, 1921, **11**, No. 53

Juxta-Articular Nodules and Syphilis.—Cange and Argaud report still another case in which the connection between the juxta-articular nodules and syphilis is unmistakable. Other manifestations of syphilis, the structure of an excised nodule, and the benefit from specific treatment confirmed the syphilitic nature of the nodules.

Intratracheal Injections in Treatment of Tuberculosis.—Balvay's experience in this line has already been mentioned in these columns (March 12, 1921, p. 757). He here states that further experience has confirmed the great relief that may follow intratracheal injection of 2 c.c. of a medicated vegetable oil. It does not cure the pulmonary tuberculous process, but it renders respiration and expectoration easier, and brings a euphoria which favorably modifies the whole clinical picture.

Eczema in Children and Its Metastasis.—The question whether curing the eczema merely "drives it in," as the layman says, is discussed from various standpoints. There is absolutely no basis for this assumption. The coincidence of eruptions and of bronchial disturbances is probably the explanation of this belief in the metastasis of eczema, but closer observation will show that they develop together, or the bronchitis may precede the eruption; it rarely develops as the eruption disappears. A tendency to prurigo may manifest itself alternately in bronchi or skin. The writers have known cases in which this alternating asthma returned occasionally up to the age of 20, long after the skin manifestations of the prurigo had been outgrown. The possibility of this should always be considered in cases of asthma in the young.

Presse Médicale, Paris

Jan. 18, 1922, **30**, No. 5

Chronic Lumbago.—Sicard and Forestier refer to chronic rheumatismal pain in the lumbar region with negative roentgen-ray findings, rebellious to the usual measures, in cases in which tuberculosis, syphilis, the gonococcus, posttyphoid spondylitis, and cancer metastasis can be definitely excluded. In five cases described, the pains had dragged along for several years, incapacitating the patients, but without sphincter disturbance. The vertebral muscles are stiff and the patient stoops; this does not occur with disease of the spinal nerve roots, as in tabes and zona, no matter how severe the pains. The seat of the process causing the lumbalgia is in the funiculi, not in the nerve roots. This assumption was confirmed by the cure after laminectomy. The aspect of the epidural space in one case is illustrated, showing a series of five grooves in the fatty tissue. They smoothed out after the operation. In all cases of funiculitis from any cause, the muscles of the spine are stiff. This in itself differentiates funiculitis from radiculitis, and removal of the laminae of three to five vertebrae has always relieved the funiculitis by opening up the intervertebral foramens, and resulted in a permanent cure.

Jan. 25, 1922, **30**, No. 7

The Intrapleural Pressure.—Rist and Strohl explain how the laws of general physics control the diffusion and absorption of gases in cavities lined with serous membrane.

Access to the Heart.—Miginiac's illustrations confirm the ample opening up of the heart which is realized by cutting the sternum across at top and bottom and then slitting it lengthwise and turning back the halves. They fold back parallel and easily, leaving an almost square opening. By working the fingers up back of the sternum it is loosened up ready to slit. In the case described the pericardium was slit and turned back, and six stitches were taken to suture the stab wound, made with tailors' scissors. The black blood spurted to a height of 30 cm. The 15 mm. wound was in the right auricle, and hemorrhage was arrested with forceps. The pulse tracings were soon normal and the three months' pregnancy was not interfered with. The hand could be introduced flat in the opening made by turning back the sternum flaps.

Schweizerische medizinische Wochenschrift, Basel

Jan. 5, 1922, **52**, No. 1

Jan. 19, 1922, **52**, No. 3

Prophylaxis of Goiter.—Half of the children in the Adliswil schools were given once a week for the school year a tablet containing 0.5 gm. cocoa and 0.001 gm. potassium iodid. This was kept up until each child had thus been given a total of 0.04 gm. of the iodid. The findings in 745 children are tabulated, comparing the 339 treated children with the 406 non-treated. The results apparently confirm Hunziker's assertion of seven years ago that the thyroid in mammals hypertrophies as a defensive reaction to iodin starvation, and it returns to normal size when iodin is supplied in the physiologic proportions. The minute amounts given these children at Adliswil answered the physiologic demand; more than this would probably be injurious.

Bovine Tuberculosis.—Pfenninger concludes his study of the relations between bovine tuberculosis and human tuberculosis by relating that he, with Hruska, applied the fixation of complement test to several hundred cattle just before slaughtering. A positive reaction was obtained in 60 per cent. of those with tuberculous processes only in glands, and in 94 per cent. of those with tuberculous processes in lungs and glands or in lungs and serous membranes, and in 100 per cent. of those with generalized tuberculosis. A positive reaction was obtained in only 2 per cent. of the healthy cattle. Neither antiserums nor vaccines nor chemotherapy have to date proved successful in protecting cattle against tuberculosis, but preventive vaccination of calves seems to be conferring an artificial resistance like that of natural immunity. Besredka has shown that by having the suspension of bacilli inhaled, the young cattle can stand up to ten times the fatal dose by other routes, and Pfenninger, by having the young animals inhale antigens of different kinds, in the usual doses, has been successful in inducing the production of antibodies for different infections. With Besredka's tuberculosis antigen, in particular, he induced profuse production of antibodies which could be readily estimated by the intensity of the response to fixation of complement tests. The prospects seem to be very promising, he reiterates, for this method of solving the problem of preventive vaccination against tuberculosis. Before the method can be applied to human beings, it should be given extensive trials on animals. The conditions of the infection in man and animals are so much alike that—even from the standpoint of research on prevention alone—bovine tuberculosis is of enormous importance.

Pregnancy Hypertrophy of the Pituitary.—Jung recalls Fehr's case in which pressure on the optic nerve by the pituitary, enlarging early in the second pregnancy, had caused bitemporal hemianopia which had persisted for ten years to date of writing, but with no signs of acromegaly, polyuria or glycosuria. The sella turcica is abnormally large. Jung reports a somewhat similar case, the bitemporal hemianopia having developed progressively during the woman's tenth pregnancy. By the seventh month the visual disturbance was severe, the papilla slightly blanched, and the roentgen findings testified to enlargement of the pituitary. The ophthalmologist ordered the pregnancy to be interrupted at once and further pregnancies prevented. This was done the next day and the third day the woman was able to recognize persons in the room, with prompt further improvement in vision, although the hemianopia and slight blanching still persist. The rapid progress and severity of the visual disturbances and their immediate retrogression suggest that the pituitary must be the seat of a latent adenoma. Under the influence of the pregnancy the pituitary became congested, and exerted dangerous pressure on the optic nerve. Arresting the pregnancy relieved the congestion, and the adenoma subsided into its former latent phase.

Chirurgia degli Organi di Movimento, Bologna

December, 1921, **5**, No. 6

Sacralization of Fifth Lumbar Vertebra.—Albanese calls the symptoms induced by this anomaly, Bertolotti's syndrome, as Bertolotti published in 1917 a comprehensive study of the subject. He describes five cases with unilateral and one with bilateral disturbances from this cause, and reports research on numerous cadavers, twenty-five fetuses, 788 European sacrums and twelve from natives of Terra del Fuego. His conclusion is that the sacralization is an atavistic phenomenon. It is found in about 4 per cent. of Europeans, and up to 41.6 per cent. in inferior races.

Tuberculosis of the Upper Extremities.—Valtancoli tabulates eighty-six cases of tuberculous lesions in shoulder, elbow or wrist, from the Rizzoli Institute, with a survey of the permanent outcome of treatment.

Nerve Blocking to Cure Contracture of the Knee Muscles.—Maragliano recalls that injection of 60 per cent. alcohol to block a trunk nerve in man arrests both motor and sensory functioning, and this proved effectual in curing contracture of both knees in a girl of 6 who had been crippled in this way for three and a half years after acute rheumatism. The contracture could be corrected under general anesthesia and a plaster cast, but it returned each time after the cast was removed. Finally he injected the alcohol into the nerve fibers innervating the semitendinosus, the semimembranosus and the long head of the biceps, and applied a cast for forty days, with a month's interval between the two sides. The knees could be then extended normally, and the child has been using them naturally for fifteen months to date, after failure of eleven months of attempts at correction by other measures. In a similar case in a boy of 8, the contracture had followed a purulent staphylococcus process in one knee, which had required arthrotomy. The ultimate results were equally good, but it took a longer time and three or four resumptions of the cast before the tendency for the contracture to return was finally broken up.

Radiographic Study of Twins with Pituitary Anomalies.—The sella turcica is abnormally small in both the young men, but one has developed to above the normal height, while a congenital deformity of the legs in his twin shortens his height materially. Both at 16 are otherwise well developed. Samaja urges study of the sella turcica in twins.

Pediatria, Naples

Jan. 1, 1922, **30**, No. 1

Amebic Dysentery in Children.—Spolverini says that amebic dysentery in Italy used to be confined to a limited area in the south, but the soldiers returning home from the war have scattered it throughout the entire country, and children frequently have it now. He describes several cases in children from 2 to 12 years old, and urges that amebic dysentery should be suspected when a child anywhere has prolonged intestinal disturbances, rebellious to ordinary treatment. The frequency and character of the stools and the anemia should suggest the true cause. In none of the children had the correct diagnosis been made, although the dysentery had lasted from six months to a year. Examining the mucus of the feces under the microscope will reveal the amebae, and intramuscular injection of emetin may cure it promptly and ward off contagion of others. The only trouble is to think of the possibility of amebic dysentery in regions where it has never been known before.

Lumbar Puncture for the New-Born.—De Stefano declares that lumbar puncture is never contraindicated in the newborn, and is absolutely required when grave nervous disturbances or cyanosis or both indicate rapid and progressive pressure on the centers in the brain. Only a small quantity of the fluid should be allowed to escape, but the puncture can be repeated, if necessary, two to four times during the twenty-four hours. In two recent cases the cord had been twisted around the infants, and artificial respiration had been required to revive them. One was born at the eighth month, the other had congenital stridor. Both took the breast well, but during the second day they developed convulsions, the fontanels bulging. Lumbar puncture released a yellowish or blood stained fluid, and a few drops of epinephrin were given. The convulsions subsided, and no further measures were needed. By lumbar puncture in case of intracranial hemorrhage in the new-born, we may ward off serious brain disturbances in later life.

To Obtain Infants' Blood for Examination.—Marchi uses a small cupping glass with a side tube blown in the glass. This side tube fits into the stopper of a centrifuge tube and collects the blood drawn into the cupping glass from a couple of small cuts made over the scapula. This aspiration device works like a charm, he says, for young and old, but is particularly useful for young infants to obtain blood for serologic tests.

Policlinico, Rome

Jan. 9, 1922, **29**, No. 2

Angiodiascopy.—Senigaglia expatiates on the information to be derived in various conditions from direct visual inspection of the veins and arteries in the peripheral portions of hands and feet. He examines them with the lamp behind them, the light from the lamp collected in a tube, against which the hand or foot is placed.

Alcohol and Surface Tension of Disinfectants.—Cignozzi adds his voice to the chorus of those who assert that addition of 70 per cent. of ethyl alcohol or of 35 per cent. propyl alcohol modifies the surface tension of disinfectants and renders them much more penetrating and bactericidal. The formula found most effectual in his long experience has been 70 per cent. ethyl alcohol containing 1 or 0.5 per cent. acetic acid.

Riforma Medica, Naples

Dec. 17, 1921, **37**, No. 51

Diagnostic Experimental Tuberculosis.—Maragliano noted edema of the thigh in forty of fifty-two rabbits inoculated with human tuberculous material plus 1 c.c. of 1:1,000 epinephrin. In thirty-eight of the animals an eschar formed. The epinephrin evidently renders the superficial tissues more susceptible to the inoculation, but it does not seem to hasten the invasion of the glands. The inoculation should be made in a region where glands abound. He has sometimes found lesions in the glands near the bifurcation of the aorta, before the inguinal or crural glands were involved, after inoculation in the groin. In twenty-eight other animals he squeezed the regional glands between his fingers after the inoculation, but the interval before the tuberculous lesion developed did not seem to be shortened. His conclusions from this research on 112 guinea-pigs are that we can systematically proceed to enucleate a regional gland or two for microscopic examination by the sixteenth to the eighteenth day, even if the palpation findings are negative.

Rivista Critica di Clinica Medica, Florence

Dec. 5, 1921, **22**, No. 34

Dec. 15, 1921, **22**, No. 35

Cholesterin and the Suprarenals.—Alessandri charts the cholesterin content of the blood in healthy rabbits and in other rabbits, before and after the suprarenals had been removed, or epinephrin injected subcutaneously or into the peritoneum. Among the facts apparently demonstrated by his research is that the increase in the amount of cholesterin in the blood which follows injection of epinephrin cannot be ascribed to the suprarenals, as it occurred about the same in the suprarenalectomized rabbits. The vasomotor phenomena after injection of epinephrin in man and animals seem ample to explain the general mobilization of the cholesterin, entailing the hypercholesterinemia, which is evidently a defensive reaction.

Repertorio de Medicina y Cirugía, Bogotá

August, 1921, **12**, No. 11

Tropical Ulcers.—Bejarano treats phagedenic ulcers with a salve containing silver nitrate, zinc oxid and balsam of Peru in petrolatum. This is applied daily after softening the ulcer with compresses dipped in a 1:2,000 solution of potassium permanganate. Echeverri advocates operative measures, describing the prompt and complete cure after a circular incision of the leg about 5 cm. above the ulcer, cutting down through the subcutaneous cellular tissue and the superficial veins and both saphenous veins, ligating those of any size, and then suturing the skin. He curets the ulcer lightly at the same time, and consequently prefers general or spinal anesthesia rather than local. The ulcer has always healed in less than three months, and there has been no recurrence. The weight must not be borne on that leg until the ulcer has entirely healed over, and the young skin must be protected against scratches and insect bites. This treatment has also proved effectual for rebellious ulcers from varicose veins.

The Blood Count in Dysentery.—García Martínez generalizes from the data he has collected that the blood count may aid in differentiation of intestinal disease: With bacillary dysentery there is polynucleosis but no increase of eosinophils, while with amebic dysentery there is slight eosinophilia in the blood, while the other findings are normal, or there may be mononucleosis in the blood, and this is almost constant in the stools. Helminthiasis induces polynucleosis with eosinophilia in the blood.

Is It Influenza?—Torres Umaña comments on a disease that has appeared at different points all over the country (Colombia) during the last few months and affects almost exclusively those persons who escaped the last pandemic of influenza. A chill, fever, headache, weakness, peculiar pains and digestive upset are accompanied with inflammation in the throat, which may or may not be painful, as the sole objective finding. This angina persists throughout the whole course, but the general symptoms are not proportional to the intensity of the throat process. The fever may drop for a day or two and then run up again. The course has varied from three days to three weeks unless ear and lung complications develop, but these are common.

Semana Médica, Buenos Aires

Nov. 10, 1921, **28**, No. 45

The Thermolaryngoscope.—Samengo gives nineteen illustrations of his laryngoscope which is warmed by electricity so that the mirror does not become obscured by condensing moisture. A head frame sustains the laryngoscope in the throat, leaving the physician's hands both free.

Experimental Goiter.—Goldemberg reports that white rats developed goiter after having had 3 mg. of sodium fluorid added to their food regularly every day for six or eight months. Their thyroid glands were five or six times the normal size, and the microscope showed goiter of the parenchymatous or colloidal type. The kidneys also showed signs of epithelial or tubular nephritis, and the young rats seemed to be stunted in their growth, with a kind of thyroid cretinism.

Jaundice in the New-Born.—Deluca found evidences of laceration of the dura mater and of more or less profuse meningeal hemorrhage in 36 per cent. of the 554 infant cadavers examined since 1907. In 34 of the 201 cases delivery had been supposedly normal; in 15 the birth had been premature; in 23 there had been manual traction with breech presentation. The meningeal hemorrhage may well explain the jaundice of the newly born child in some cases. Jaundice may thus sometimes be regarded as a sign or symptom of meningeal hemorrhage. In 5 cases the jaundice developed the day after birth and the fontanels bulged. Lumbar puncture released a bloody fluid, and the child had convulsions later and died the fifth day, or else the jaundice did not develop till the sixth day and the child died the seventh. Only 2 of the children in this group recovered. He is investigating now to determine whether it is possible for meningeal hemorrhage to occur without jaundice.

Pregnancy in Heart Disease.—Ruibal Salaberry states that in a group of thirty-seven women with heart disease, the other organs apparently intact, all have passed through normal pregnancies without apparent damage, and have now a total of 114 children. The children were of the average size and were all normal. He gives the details of each of the thirty-seven cases. The heart disease was a mitral defect, myocarditis, or aortic defect, and in one case more than one valve was affected.

Archiv für klinische Chirurgie, Berlin

Nov. 24, 1921, **118.** A. Bier Festschrift. Second Third

Present Status of Prostheses, Etc., for Jaws. H. Schroeder.—p. 275.
*Correction of Flaccid Paralysis. E. Hayward.—p. 298.
*Injury of Blood Vessels. H. Küttner.—p. 303.
*Substitutes for Ligation of Vessels. F. Momburg.—p. 330.
*Importance of Sclerosis of Portal Vein. V. Hart.—p. 337.
*The Blood Capillary Circulation. A. Hintze.—p. 361.
*Indications for Operations on the Thyroid. H. Grauert.—p. 381.
*Parathyreopriva Tetany. A. v. Eiselsberg.—p. 387.
*"Marble Bones." F. Schulze.—p. 411.
Treatment of Fistulas, etc., After Gunshot Wounds. Blecher.—p. 439.
*Bone Abnormalities in the Young. K. Vogel.—p. 446.
*Blunders in Diagnosis of Tuberculosis of Bones. E. Kisch.—p. 481.
Experimental Free Grafts of Periosteum. W. Baetzner.—p. 504.
*Neurotic Ossifying Myositis in Paralyzed Limbs. A. Israel.—p. 507.
*Inflammatory Tumors on Metatarsal Bones. C. Deutschländer.—p. 530.
*Rib Operations to Improve Scoliosis. F. Sauerbruch.—p. 550.
*Treatment of Fractured Radius. R. Klapp.—p. 563. Id. F. Bange.—p. 578. Id. P. Eden.—p. 592.
*Braun's Splint for Fractures. Braun.—p. 594.

Correction of Flaccid Paralysis.—Hayward remarks that the conditions with flaccid paralysis of the hip, for example, are much like those after exarticulation of the hip joint, except that there are plenty of supports for the prosthesis. In a case described he applied the principles that have been found useful for the amputated. In this instance he substituted for the paralyzed ileopsoas muscle, a flap from the external oblique muscle. This tongue-shaped flap of muscle and fascia was 6 cm. wide and 10 cm. long. The ileopsoas was divided close to the horizontal ramus of the pubis, and the flap was twisted around to correspond to the direction of the ileopsoas. The gap of 7 cm. was bridged with a piece cut from the fascia lata through the same incision. The hip now can be moved actively, and the prosthesis for the leg, constructed on the principle of an artificial leg, bends the knee passively. The success in this case teaches that by combining muscle plastics with a modern prosthesis for thigh amputations, we can uncripple the cripples to an astonishing extent.

Indirect Injury of Vessels.—Küttner analyzes the mechanism of injury of vessels from contusion, traction, torsion, compression, etc. His study is based on war wounds, but the conclusions apply to peace wounds as well.

Substitutes for Ligation of Vessels.—Momburg reviews the various methods in vogue, and says that twisting a small vessel and compressing the twisted portion still seems the best substitute when ligation is not applicable.

Sclerosis of Portal Vein.—Hart describes the clinical course and necropsy findings in two cases, and discusses the importance of sclerosis of the portal vein in general.

The Capillary Circulation.—The way in which the capillaries fill with blood and the mechanical causes influencing this are discussed by Hintze, with some colored plates.

Thyroid Operations.—Grauert argues that when only a few symptoms suggest exophthalmic goiter, or when the symptoms have subsided, leaving extreme euphoria, these should be regarded as indications for operative treatment and as the most propitious moment for it. The euphoria is liable to yield suddenly to grave exacerbation of the former symptoms. In one family the whole clinical picture of exophthalmic goiter was equally divided between two sisters. He thinks this distribution of symptoms among the members of a family is not sufficiently heeded at present. Another point to which he calls attention is the possible alternation in the same person of symptoms indicating insufficient and excessive endocrine functioning. An operative cure was realized in two cases he describes in which exophthalmic goiter developed in women of myxedematous type. In another case there were symptoms of schizophrenia in addition but all subsided after partial thyroidectomy.

Treatment of Parathyroprival Tetany.—Eiselsberg had a recent case of this kind, and reviews his total experience. The postoperative tetany proved fatal in 9 cases, and in 2 that date from Billroth's day, the tetany persisted unmodified during the thirty-nine and twenty-one years till death. He has had 8 cases of severe and about 24 cases of mild postoperative tetany in twenty years, in a total of 2,588 strumectomies, including 215 for exophthalmic goiter. He adds that Vienna seems to be a center for spontaneous tetany. Even the mildest form of postoperative tetany is dangerous, as cataract may develop years later. Parathyroid and calcium lactate treatment of parathyreopriva tetany was frequently effectual, but in 2 cases he implanted thyroid tissue in treatment, parathyroid tissue not being available at the time. Transient benefit followed in one case. In 7 other patients he implanted parathyroid tissue, and decided and durable benefit was realized in 3 cases; one patient died from pneumonia, and no effect was apparent in the 3 others. The parathyroids had been taken from new-born infants in 2 of the cases, but no effect was apparent, as also with monkey parathyroids in 2 cases. About 20 cases of human parathyroid implants are on record. The outcome is difficult to estimate.

"Marble Bones."—Schulze refers to the peculiarly compact bone which fractures exceptionally easily, and looks like marble. He adds another to the six cases on record.

Bone Disease in the Young.—Vogel explains the Legg-Calvé-Perthes hip joint disturbances, Schlatter's, Madelung's and similar affections as a local derangement in the epiphysis line. Coxa valga and vara are traceable also to it, as he shows from his extensive experience.

Blunders in Diagnosis of Bone and Joint Tuberculosis.—Kisch has been surprised to find that certain cases labeled tuberculous processes were in reality gonococcus, syphilitic or rheumatic lesions. The differential points include pain—which is comparatively rare with the insidiously developing tuberculous process; the bilateral involvement, common with syphilitic lesions; inoculation of animals with secretions from the lesion, and the typical roentgen picture as he shows it in numerous cases. In coxa plana, abduction alone is hampered, but with tuberculous hip joint disease, movement in any direction is painful.

Ossifying Myositis in Paralyzed Limbs.—Israel concludes from his clinical experience and study of the literature that these paraosteo-arthropathies represent a special tissue reaction in limbs with paralysis of central origin.

Inflammatory Tumors of the Metatarsus.—Deutschländer calls attention to a group of cases, all in women of middle age, with disturbances suggesting flatfoot developing suddenly, progressing for several months, and then declining. The only positive finding is local tenderness in the shaft of a metatarsal bone at the junction of the middle and distal third. The movement of the corresponding toe is painful. Roentgenoscopy finally, by the ninth week, reveals what seems to be an exostosis, but the clinical features, the benefit from hyperemia, and the final recovery demonstrate the inflammatory nature of the lesion. It is a metastatic bacterial embolism in the capillary network, entailing a subacute periostitis at the spot.

Operative Treatment of Scoliosis.—Sauerbruch declares that the graver forms of scoliosis can be corrected best by operations on the ribs, and describes two typical cases to show what can be realized by this means. The results surpass those of orthopedic measures alone. The war surgery of the thorax has opened this field for treatment of grave scoliosis.

Fracture of the Radius.—Klapp applies strong traction to the thumb and fingers separately, and manipulates the fragments with the wrist held in a crescent shaped iron standard. Then he applies for two or three weeks a plaster cast to the forearm and hand, leaving thumb and fingers free. Bange analyzes 649 cases, and extols the perfect results of Klapp's method.

Braun's Splint for Fractured Legs.—Braun suspends the foot from the top of a small frame, while the leg is suspended from the horizontal extension of the frame on each side. The leg is slightly flexed at knee and hip, which renders the position comfortable, while traction can be applied as desired.

Deutsche medizinische Wochenschrift, Berlin

Dec. 22, 1921, **47**, No. 51

Good Effect of Febrifacients on Disturbance of Sleep in Late Epidemic Encephalitis.—Lust reports his experiences with parenteral injections of milk and other substances for the purpose of inducing sleep in a child of 1 year and 8 months that had suffered for more than a year from serious disturbance of sleep following an attack of epidemic encephalitis. An hour and a half after the first intramuscular injection of 2 c.c. of boiled milk the child fell asleep and slept soundly for twelve hours. During the day it was quiet and contented, whereas for months it had cried a good deal and had been restless. The next night no milk injection was given, and the child passed a restless, sleepless night as usual. But every time the milk injection was given in the evening it exerted in the beginning the same sedative effect that it did the first time. The child always fell asleep soon after receiving it and awoke the next morning after a quiet, deep sleep. Injections of whey or of casein were found to have the same effect as milk. After a time the effect of the injections was not so constant. It was discovered that the child fell asleep following the injections only when the parenteral injection of the protein had brought about an increase of temperature. If when the child was asleep, its temperature fell below normal, it would usually wake. Apparently an increase of temperature from 37.5 to 37.8 C. was sufficient to induce sleep or to produce at least a sedative effect. High temperatures increased still further the soundness of the sleep. But since the effect of the injections was only symptomatic and in no wise permanent, Lust admits that the value of the method is quite limited.

Postoperative Leukocytosis.—Stahl discusses several cases in order to explain how he reached the conclusion that the cause of the postoperative leukocytosis is the parenteral absorption of protein and the infection of the operative wound, which takes place in spite of all precautions.

Medizinische Klinik, Berlin

Dec. 11, 1921, **17**, No. 50

Acute Meningitis in Early Syphilis.—The prognosis of acute syphilitic meningitis is good if it is recognized and specific treatment started in time. Only four cases are known with necropsy, and Nonne here adds another to the list, with spirochetes found in the cerebrospinal fluid. The meninges of the entire central nervous system showed leptomeningitis. The symptoms were those of meningitis in general. The Wassermann reaction was negative in the spinal fluid in some of these cases, but the mastic test was always positive in the cases in which it was applied. The working man of 48 had been given a vigorous mercury and arsphenamin course of treatment during the second and third month after infection. In the fourth month he had complained of headache. The other symptoms of acute meningitis developed six months after infection and proved fatal in ten days. Nonne is convinced that acute syphilitic meningitis is more common now than it used to be, and he incriminates arsphenamin for this. The case teaches that syphilis should always be thought of in cases of acute meningitis; the benefit from specific treatment may be the only clue to the differential diagnosis. Nonne asks why in his case and in Fahr's similar case no improvement could be detected under specific treatment although the lesions were comparatively mild.

Activation of Arsphenamin by Mercury.—Kolle states that addition of mercury reduces instead of increasing the toxicity of the metal arsphenamins while it increases their chemotherapeutic action. The mercury has to be in the form that oxidizes least readily. He found that syphilized rabbits bore mercury better than normal rabbits.

Intermittent Limping.—Schlesinger comments on the frequent blunders in differentiating intermittent claudication as the intermittent character of the disturbances is overlooked. Some of his patients had long been treated for assumed flatfoot without benefit. Others had been taking courses of treatment for rebellious neuralgia, muscular rheumatism, gout or hip joint disease. The intermittent nature of the disturbances, their development only during exercise, and rapid subsidence during repose, and the absence of a pulse in the foot should suggest the proper diagnosis. The importance of smoking as a factor in intermittent claudication is demonstrated anew by his hundreds of cases. Even moderate smoking may bring back the symptoms. Chilling, nervous influences and other factors are of much less etiologic import. A disturbance in the balance between the vasodilators and the vasoconstrictors is a special element in intermittent claudication; the vascular reflexes seem to behave the reverse of normally: The vasoconstrictors respond to stimuli which in the normal act only on the vasodilators. Cold applications elicit the same response as in the normal only more intense, but heat elicits the same response as cold: If the feet are held in hot water, they blanch and look livid. They may not redden for several minutes or not until after they have been taken out of the hot water. Only in very few of his numerous cases did it prove impossible to ward off gangrene. In prophylaxis, chilling must be avoided and exercise should not be forced. Tobacco must be given up and highly seasoned and salted foods. Every year he encounters cases in which local heat applications for the mistakenly diagnosed gout or rheumatism had been followed by gangrene. He warns expressly of the futility and actual harm of procedures to apply local heat. Many have reported intense exacerbation of the pains under them. Tepid baths may be useful to warm the feet, and warm stockings and shoes are indispensable. The continuous current usually renders good service. Of the various drugs recommended for intermittent claudication he has found sodium nitrite by subcutaneous injection extremely effectual; by the mouth it has no effect. He says that he injects half a Pravaz syringeful daily of a 0.2:10 aqueous solution of the sodii nitris, giving a course of twenty or thirty injections, increasing after the first to a whole syringeful. Congestion, slight dizziness or redness of the face are signs of intoxication. He commends this treatment as he has applied it in more than a hundred cases in the last ten years. Several patients with beginning gangrene and agonizing pains were delivered from the use of morphin by this means. Nitroglycerin subcutaneously is also useful, but disagreeable by-effects are common with this drug. In some recent cases strychnin dilated the vessels but only in the diseased limb. On the whole, he says, his experience justifies a more favorable prognosis for intermittent claudication than would be assumed from the literature. Arrest of disturbances and retrogression of far advanced changes, with restoration of earning power, are comparatively frequent.

Treatment of General Paresis.—Fischer reiterates his assertions that with sodium nucleinate we can count on an actual cure of a certain proportion of our cases of general paresis. His thirteen years of experience have shown 7.5, 16, and 56 per cent. cured without relapse in three series of forty, eighteen and sixteen patients with general paresis. Only 50, 40 and 8 per cent. in the same groups failed to show any benefit. He has found specific treatment as for syphilis entirely ineffectual. The prospects are better the younger the patient and the shorter the duration of the paresis. Of all the means to induce the therapeutic leukocytosis, nuclein has given the best results to date. He declares in conclusion that

a course of leukocytosis treatment should be given as a routine measure in prophylaxis of paresis to every syphilitic on concluding the specific treatment for the syphilis. He compares the results of treatment of paresis with tuberculin or by inducing malaria, or other means to stimulate leukocytosis. He does not describe his technic, stating merely that courses were given to a total of 3, 5, 8 or 14 gm. of nuclein during the year. He advises repeating the course annually. In twelve cases all under 40 in which he gave over 10 gm. of nuclein, a cure was realized in 58 per cent. Fischer is professor of dermatology at Prague.

Therapeutic Pneumoperitoneum.—Sorgo and Fritz add another case to the list of those in which tuberculous peritonitis of recent development subsided under insufflation of 1,500 and 1,000 c.c. of air after withdrawal of 3,000 and 2,000 c.c. of ascitic fluid. There was an interval of fifteen days between the insufflations. The young woman has been apparently in good health during the months since.

Mitteil. a. d. Grenzgeb. d. Med. u. Chir. Jena

1921, **34**, No. 3

Tests of Functional Capacity of the Kidneys.—Lehmann and Elfeldt analyze the findings in extensive application of the water freshet test and the concentration test. For the first, the 1½ l. are ingested, fasting, in forty-five minutes, after the bladder has been emptied. The urine is collected every half hour for four hours. Then (usually noon) the concentration test is begun by refraining from all fluids until 8 the next morning. The urine is collected every two hours till 10 p. m. and again at 2 a. m. Then cystoscopy, chromocystoscopy and catheterization of the ureters complete the examination. In normal conditions, the largest half hour freshet of urine reaches 500 c.c. and the concentration reaches 1.030. These tests do not decide definitely whether one or both kidneys are diseased, but they certainly confer confidence in operating when they show that the sound portions of the kidney seem to be adequate to their task. They classify a number of kidney cases by their response to these tests and the outcome of the case.

The Path of the Food Through the Stomach.—Katsch and Friedrich gave a contrast meal to a number of healthy subjects, and found that the food did not pass predominantly along the lesser curvature, but spread through the greater curvature. Mechanical factors thus cannot be held responsible for the predilection of gastric ulcers for the "stomach street" (*magenstrasse*), along the lesser curvature.

Mechanical Features of the Cerebrospinal Fluid.—Propping replies to criticisms of his hydrostatic theory of the cerebrospinal fluid. He discusses, in particular, Heller's hydrodynamic theory.

Decapsulation of Kidney in Mercuric Chlorid Poisoning.—Rollwage found that decapsulation of the kidneys was borne without apparent injury in 2 personal cases described and in 9 found in the literature, but the patients all died except one, while other patients not decapsulated recovered, even when, in some nondecapsulated cases, the anuria had lasted for eight days. One instance is known of recovery after decapsulation, and, in all, this operation seemed to be responsible for postponing the fatal termination for a few days. He urges that in future decapsulation should be done early and only on one kidney. This would allow better insight into the effect of the operation when compared with the other kidney at necropsy.

Muscular Spasm with Flatfoot.—The electrocardiographic finding in muscle contracture with flatfoot are reproduced and interpreted.

Clinical Research on Tetany.—Melchior's subtitle for the chapter on undernutrition, osteomalacia, and spontaneous and postoperative tetany, is "Pathologic Constitutions." He declares that the tetany question is more complicated than it has seemed hitherto. Many contradictory phenomena can be explained only by assuming constitutional factors. His second chapter deals with fatal parathyroprival coma, of which he cites some instances from the records and a personally observed case. One chapter is devoted to visceral and secondary tetany. Two cases of spasm of the stomach are described, and one of visceral tetany accompanying gallstones, with one of cardiospasm and hysteria.

Münchener medizinische Wochenschrift, Munich

Dec. 9, 1921, **68**, No. 49

Treatment of Oxyuriasis.—Nordhof describes the treatment he uses for oxyurids in children. The treatment begins with a soapy full bath, especial attention being given to the anal region. The hands of the child are scrubbed with a nail brush, the finger nails being thoroughly cleaned. The anal opening is anointed with mercurial ointment and a pad of cotton is applied. It is sometimes expedient to put a closed garment about the loins of young children to keep their hands away from the anal region. The bed linen must be changed frequently. After defecation, the anal region should be thoroughly cleansed with soap and water, while the ointment and cotton are again applied. The hands are again scrubbed with soap and brush, and the nails are carefully cleaned. Full baths should be given frequently. As the life cycle of oxyurids in the intestine, from the time the ovum enters the mouth to the time when the female appears at the anal opening, is about fourteen days, the treatment should be extended over a period of at least two weeks, or preferably a few days longer. Nordhof states that this method has never failed him. [He does not seem to think it necessary to give a vermifuge internally.]

Wiener Archiv für innere Medizin, Vienna

Jan. 20, 1922, **3**, No. 3

Findings After Radiotherapy in Exophthalmic Goiter.—Roth's tabulated details of the gas interchanges and metabolic findings in four cases of exophthalmic goiter, after systematic treatment with the roentgen rays, confirm the unmistakable benefit therefrom in recent cases. When the case is of long standing, the course long and chronic, the radiotherapy may fail to relieve. Otherwise, even when the symptoms do not show much change, the metabolic findings testify to the great transformation realized. Alimentary glycosuria could no longer be induced, in his cases, but the effect of the radiotherapy was most manifest in the respiratory gas interchanges.

Diseases of the Seasons.—Rusznyák charts the seasonal prevalence of rheumatism (287 cases), pulmonary tuberculosis (3,266), neuroses (1,191), exophthalmic goiter (122) and gastric ulcer (95), gallstone mischief (232), diabetes (158),

valvular defects (532), and arteriosclerosis (702). Nearly all of this material shows two peaks in the course of the year. Spring and fall seem to be the critical months for the majority of diseases. The resisting power of the organism seems to be at its lowest in the spring and fall, and the adjusting mechanism is not equal to its task. The practical importance of this research is in prognosis and prophylaxis. In 164 cases of nephritis, the sudden increase in April and November is undoubtedly due to injury from chilling. With valvular defect (532 cases) the extra demands made on the circulation as spring advances explain the seasonal prevalence, but with arteriosclerosis the injurious effect of chilling is evident in a second peak in November, and in the fact that cerebral hemorrhage generally occurs in winter.

Pregnancy Kidney Disease.—The great progress realized of late in our knowledge of kidney diseases has thrown light on the nephropathies of pregnancy. They are of two types: a nephrosis with edema and retention of salt and water, but no increase in the residual nitrogen in the blood, no rise in blood pressure, and no change in the fundus. The other form is more of a nephritis, and retention of nitrogen, a rise in blood pressure and albuminuric retinitis are much in evidence. The first form yields to restriction of salt and of water, but this is of no avail in the second form, and the rapidly progressive nature of the eye changes generally call for artificial interruption of the pregnancy. Both these forms of kidney disease are the work of some still unknown injurious agent which acts on the vessels of the subcutaneous cellular tissue (edema without albuminuria), or on these vessels and also on the kidney vessels (nephrosis), or only on the kidney vessels (nephritis), or only on the vessels in the brain (eclampsia).

Sternomediastinal Dulness.—The importance of the exact differential diagnosis of dulness above the sternum was rendered evident by a case in which a prominent aorta was responsible for it; the woman had a goiter and the presumptive diagnosis had been substernal goiter. Roentgenoscopy in the oblique direction, towards the arch of the aorta, explains the dulness when the sternum is outlined by a wire stuck to the skin, so that the distance between the sternum and the aorta can be estimated. In normal conditions, the ascending aorta and the arch are the same distance from the sternum, about 2 or 3 cm. Normally the right lung extends like a wedge back of the sternum. But with a destructive process in this lung, it shrivels and retracts, leaving an area of dulness at the sternum which no roentgen shadows of the sternum region can explain. The area does not clear up with deep inspiration as it does when the dulness is due merely to the unusual extension of the right lung to the left margin of the sternum.

Resisting Power of the Erythrocytes.—Hemolytic jaundice is distinguished by the fragility of the erythrocytes, while pernicious anemia is distinguished from all other anemias by the greater resisting power of the erythrocytes. The research reported here has apparently demonstrated that the resisting power is increased by the bile salts. None of the other substances investigated displayed action in this line. Consequently, if in certain diseases we find the erythrocytes less fragile than expected, if we can exclude the action of bile salts, we can ascribe the increased resistance to the presence of young blood corpuscles.

Purpura.—Sternberg distinguishes between the purpura with fever and other anaphylactoid manifestations—the thrombocytes in normal proportions—and the purpura without fever, with essential thrombopenia. He describes in detail some typical cases of each type, especially the chronic continuous essential thrombopenia, the chronic intermittent, and the acute essential thrombopenia. The case of the latter was in a woman of 30, previously healthy except for cholecystitis two years before. She had complained of headache and dizziness for two days, and there had been bleeding from nose and gums, and purpura patches. She died the third day and necropsy disclosed hemorrhages in the meninges and cerebellum. The angiopathic type of purpura includes the anaphylactoid, the toxic and the deficiency diet types. Thrombopenia alone does not explain the hemorrhages; there must be some other factor acting on the walls of the capillaries. Four clinicians have reported favorable results from splenectomy, but this removes only one link in the chain, and it had no effect in the one case in which Sternberg applied it. In another case the woman of 64 had epidemic encephalitis following influenza, and she succumbed to inanition from uncontrollable vomiting. During the last ten days her body was covered with purpura patches.

Action of Gastric Juice on Bacteria.—Hajós' experiments confirmed that the disinfecting action of the gastric juice is connected with the proportion of free hydrochloric acid in it. It takes fifteen or twenty minutes for normal gastric juice to destroy typhoid, colon and dysentery bacilli. Bacteria in fluid food are liable to be passed along out of the stomach too fast for disinfection, while bacteria in meat or other solid food are more likely to be destroyed by the gastric juice.

Sugar in Blood Corpuscles.—Csáki asserts that in blood in its natural condition the blood corpuscles are nearly if not entirely free from sugar. In diabetes, the corpuscles are permeable for sugar.

Edema in Diabetes.—Földes found that edema developed in diabetics only when there was acidosis, and it subsided and returned with the latter. The acidosis renders the kidneys less permeable for salt and water and thus prepares for the edema. He explains the mechanism of the paradox that small doses of sodium bicarbonate seem to promote edema while large amounts banish it.

The Schilling Blood Picture.—Haynal's experience in fifty-three cases has confirmed the reliability of Schilling's estimation of the blood picture. He extols its simplicity in comparison with the Arneth classification, as it does not require careful examination of the nuclear subdivisions, the ratio between the corpuscles with only slightly indented nucleus and those with nuclear fragmentation being instructive enough for all practical purposes. He merely notes the ratio between Arneth's Class 1 and Arneth's Classes 2 to 5. Haynal gives the exact figures for the different classes according to the Schilling conception of the normal standard.

Wiener klinische Wochenschrift, Vienna

Dec. 1, 1921, **34**, No. 48

Dec. 8, 1921, **34**, No. 49

Zeitschrift für Tuberkulose, Leipzig

December, 1921, **35**, No. 4

Filling for Tuberculous Lung.—Stöcklin describes thirteen cases and two years of experience with loosening up the lung from the chest wall and implanting a paraffin filling. It is applicable only when the process is predominantly unilateral, with tendency to cavity production. Baer resected a rib, but he merely divides one or two ribs from their cartilages. With this they can be pried up enough to allow the pneumolysis with the finger. Nerve blocking plus sedatives answered for the anesthesia. The extrapleural cavity is then packed with disks of paraffin about the size of a 5 franc piece, of different thicknesses, fitting them in by pressing them against the ribs. The total amount was 600 to 1,000 c.c. or less. The paraffin, with a melting point of 50 or 52 C., was mixed when soft with 0.5 to 1 per thousand vioform and 0.5 to 1 per cent. bismuth carbonate. The cases were all those in which pneumothorax was indicated but had been impracticable. Access from the rear is preferable when the superior lobe is involved. This filling method has the advantage over thoracoplasty that

the functioning of the rest of the lung is not interfered with, and there is no deformity left. But thoracoplasty is preferable when the entire lung is to be compressed. The pleura usually reacts with an effusion, and the case has to be watched to detect in time the bulging from the accumulating fluid, and release it. In the eleven surviving patients there are no signs of infection of the filling, and the cavity did not break through in any instance. In one case the filling had been applied as a last resort to cure recurring hemoptysis. The operation proceeded without mishap, but signs of aspiration pneumonia had been discovered in the other lung just before the operation, and the man of 57 succumbed to this. Necropsy revealed that the filling had been successful.

Curability of Pulmonary Tuberculosis with a Cavity.—Orth protests against Gräff's recent assertion that a cavity signifies that the patient is doomed. He admits that a cavity materially aggravates conditions, especially as it invites mixed infection, but he declares that thirty-six years ago he was teaching that the cavity may become lined with fibrous tissue, which is equivalent to healing over, and the progress in treatment has made this of more common occurrence during the years since.

Hart insists that if search is made at necropsies for old healed cavities, they will be found unexpectedly frequently. He has often been astonished at the absence of other foci in the lungs when a large cavity has been confirmed at necropsy. In many such cases the cavity must have been of several years' standing. The bacilli seem to become less virulent, the older the cavity. The stiff walls of the cavity may prevent its joining in the expansion of the lung, and the bacilli in it may not get the oxygen they need. Material thus cannot be forced out of the cavity. Another favorable factor is the relative increase in the protecting forces of the lung tissue and entire organism acquired in the course of the infection. This also helps to explain the lack of further dissemination of infection from a cavity in certain cases.

Biologic Cure of Tuberculosis.—Amrein replies to Liebermeister's assertions in regard to the indispensability of tuberculin treatment, that climatic, physical and dietetic treatment had induced clinical cures long before tuberculin was introduced into therapeutics. He cites some from his own experience, and remarks that Sahli's intradermal tuberculin treatment has a number of advantages over the subcutaneous and other methods. The reaction occurs under our eyes and can be measured, while general and focal reactions are avoided. This specific treatment is especially valuable, he adds, in the early stages (bronchial glands in children, etc.), aiding in the production of the immune protection.

Zeitschrift für urologische Chirurgie, Berlin

Jan. 9, 1922, **8**, No. 5

More Comprehensive Operations for Bladder Cancers.—Latzko gives in fourteen illustrations the technic he advises for resection of bladder cancer on the principle of operative treatment of uterine cancer, removing with it the regional connective tissue and lymph glands, into certainly sound tissue. He shows the planes of cleavage and the ease with which the portions containing the blood and lymph vessels here can be traced, ligated and severed. They are divided close to the uterus, and the internal genital organs are sutured to the peritoneum to roof over the bladder entirely. Not until this has been completed is the bladder itself touched; consequently, the operation on the bladder is extraperitoneal. The paracystium is removed with it the same as the parametrium with uterine cancer.

Amyl Nitrite Admixture for General Anesthesia.—Winkler refers to recent research which suggests that the changes in the lipoids of the cell under the influence of an anesthetic reduce the solubility for oxygen. The deduction seems inevitable that the less the amount of active oxygen in the cells, the less of the anesthetic is needed. By partially shutting off the blood supply to the brain we reduce the amount of oxygen, and thus can obtain the anesthetic effect with less of the drug. Or this same condition can be realized by inhalation of amyl nitrite. The latter has long been known to be an antidote to chloroform, and Winkler proposes its use systematically in general anesthesia. To avoid the depressing action on the heart, he saturates the amyl nitrite for several hours with carbonic oxid. The amyl nitrite thus charged with carbonic acid, mixed with ether (6:1,000), induced in animals a smooth and apparently harmless anesthesia with a remarkably small amount of the ether, and the effect in 100 clinical cases was equally favorable. He asserts from these experiences that the drugs form a loose combination with the cell and are rapidly eliminated; the patient rouses promptly afterward, and there are no postnarcotic disturbances and no irritation of the kidneys. He drops the fluid on a pad of gauze, rather than a mask. The amyl nitrite-mixture can be preceded with a whiff or two of ethyl chlorid if desired. The odor of the mixture can also be masked by adding 10 drops of Oleum pini pumilionis to 100 gm. of the mixture. There is no or only a very slight phase of agitation, and the narcosis can long be held on an even plane. Consciousness returns almost immediately, and there is no nausea or vomiting, no bronchitis or pneumonia, but saliva secretion is increased. Salivation can be warded off, however, by preliminary swabbing of the mouth with a 0.5 per cent. solution of atropin. In short, he reiterates, addition of amyl nitrite deprives ether of much of its danger.

Zentralblatt für Chirurgie, Leipzig

Nov. 19, 1921, **48**, No. 46

Zentralblatt für Gynäkologie, Leipzig

Nov. 12, 1921, **45**, No. 45

Nov. 19, 1921, **45**, No. 46

Abnormal Contraction Phenomena in the Intestines.—Mayer discusses various localized contractions of the intestine that, as distinct from the normal intestinal movements, are confined to the same place for some time and, to a certain extent, interrupt, or modify the normal peristaltic wave. His attention was first called to them at a necropsy, but since then he has observed the same phenomena during the course of laparotomies—in the small as well as in the large intestine. As a rule, the condition disappeared after a few moments, but sometimes it persisted for some time. In the most common form, the spasm affects the whole circumference of the intestinal tube. Within the area affected by the spasm (a few centimeters in length) the intestine is occasionally reduced to the size of a lead pencil and presents an hour-glass appearance, as compared with the rest of the intestine, reminding one of an intestinal stenosis. In the second type, the small intestine, for the length of from 20 to 25 cm., was about the thickness of the little finger, contrasting thus markedly with the balance of the intestine. At the periphery of the contracted portion of the intestine could be noted many round longitudinal fibers about 2 mm. thick, which in places presented the appearance of a bundle of slate pencils. The substratum of these longitudinal bundles seemed to be formed by an agglomeration of helminths. After the laparotomy the phenomenon could not be rediscovered. The postoperative course was not disturbed, although, as the result of special treatment, numbers of ascarids were eliminated. The third and last type was rarely seen—only in the large intestine: Before the eyes of the operator there was formed a longitudinal furrow in the cecal wall about the length and width of

a finger. Crosswise of the furrow rose up several parallel ridges of the thickness of a lead pencil, so that the furrow presented the appearance of a ladder. From his investigations Mayer was led to conclude that the phenomena were due to peculiarities in the smooth musculature in general, like the spasms in uterus and bladder.

Gann, Tokyo

December, 1921, **15**, No. 4

*Nitrogen in Protein of Chicken Sarcoma. T. Furuhata.—p. 27.
*Chemotherapy of Sarcoma. T. Ogata, M. Ishibashi, et al.—p. 41.
Cancer in Manchuria. K. Yamamoto.—p. 53.
*Cancer of the Thymus. I. Honda and K. Taguchi.—p. 57.

Protein in Chicken Sarcoma.—Furuhata's extensive research with the Van Slyke amino-acid method of analysis, applied to chicken sarcoma tissue and normal chicken tissues, failed to reveal any marked difference in the distribution of nitrogen. This suggests that tumor cells do not differ constitutionally from normal cells. The charts and long summary are in English.

Experiments in Chemotherapy of Sarcoma.—Certain complex cobalt salts displayed an evident curative action on rat sarcomas after subcutaneous injection, but not by the vein.

Cancer of the Thymus.—Three cases of primary malignant disease of the thymus are reported from Kyoto. It was a necropsy surprise in all, the two women of 52 and 32 and the man of 64 having died under the clinical diagnosis of heart disease and pleurisy, appendicitis or bronchitis and hemorrhage in the spinal cord. In two of the cases the structure was that of a carcinoma. (In German.)

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

Nov. 19, 1921, **2**, No. 21

*Herbals. G. van Rijnberk.—p. 2528. Cont'd to No. 24.
*Test for Sugar Content of Blood. D. Schrijver.—p. 2534.
Hereditary Multiple Atheromatosis. A. Willemse.—p. 2539.
Influence of Reaction on Pancreas Amylase. J. T. Groll.—p. 2541.
*Syringomyelia with Autophagia. T. J. J. H. Meuwissen.—p. 2545.
Fibromyoma on Thumb. J. F. O. Huese.—p. 2551.
Training of Specialists. L. J. J. Muskens.—p. 2574.

Old Herbals.—This is the first one of a series of short articles describing the "Herbals" of former centuries, some new ones, dating from about the fifteenth and sixteenth centuries, having recently become available. Van Rijnberk reproduces some of the pictures of plants.

The Benedict Test for Sugar in the Blood.—Schrijver used a 2:1,000 solution for the Benedict test, which thus could be applied to as small a quantity as 0.2 c.c. of blood. His research was undertaken to determine the blood sugar in mental disease. In 154 double applications of the test, the response varied very little, not more than the natural range of error with such a simple test.

Syringomyelia with Autophagia.—The woman with typical syringomyelia had long had the habit of biting her nails and nibbling at the fingers of the left hand. Roentgenograms in 1906, 1908 and 1921 show that the fingers have thus been completely nibbled away, almost down to the carpus. She is now 51, and in her household work frequently burns herself but does not feel it.

Hospitalstidende, Copenhagen

Dec. 7, 1921, **64**, No. 49

*Fracture of Metatarsal Bone. C. J. Baastrup.—p. 769. Conc'n No. 50, p. 785.

Fracture of Fifth Metatarsal Bone.—Baastrup argues to prove that fracture of the tuberosity of the fifth metatarsal bone pries off a fragment of bone which is the bone described by Vesalius as a normally separate bone.

Dec. 21, 1921, **64**, No. 51

*Diverticulum in Esophagus. V. Schmidt.—p. 801. Conc'n No. 52, p. 817.
*Measurement of Air Breathed. C. Lundsgaard.—p. 810.

Pulsion Diverticulum in Esophagus.—Schmidt reports nine cases. The pulsion diverticulum had been diagnosed before the operation in all but two. Three of the patients died, one with uremic manifestations; the two others showed no signs of infection. These cases confirm that operations on the esophagus are not always borne well. Two of the patients recovered promptly after ligating the diverticulum at its base and suturing the stump when the sac had sloughed off; this method takes usually about eight days. Goldmann had no deaths in his twenty-two cases with this method. Schmidt describes his nine cases in detail, with the roentgen findings.

Measurement of Intake of Air.—Lundsgaard gives an illustrated description of the simple water and oxygen apparatus he has devised to measure the air inspired and expired and for other research on the respiration.

Hygiea, Stockholm

Nov. 30, 1921, **83**, No. 22

*Pathogenesis and Treatment of Rachitis. I. Jundell.—p. 753.

Pathogenesis and Treatment of Rachitis.—Jundell regards rachitis as the consequence of an overloading of the general nutritive functions. The overnutrition hampers the functioning of the cells, and thus the production of certain specific substances in the endocrine glands is reduced. These glands therefore fail to produce their normal quantities of hormones. The overloading may be from an excessive load, or from a constitutional or temporary inferiority rendering the ordinary load more than can be borne. The remarkable results that he has achieved with relative inanition in treatment of rachitis confirm, he declares, the correctness of this view. He has never seen rachitis develop in a child that, on account of pylorospasm or other cause, had not received the usual amount of nourishment. With atrophy from other causes, rachitis is liable to be extreme. Since early in 1919 he has been treating rachitis on this basis, keeping the child in relative inanition. This alone generally cures in mild cases. When supplemented with phosphorus and cod liver oil, even the severest rachitis subsides in a month, or in two at farthest. He gives three teaspoonfuls of the cod liver oil daily, adding 0.5 mg. phosphorus to each teaspoonful. With overfeeding, the cod liver oil does not prevent the development of rachitis, and it has an uncertain action as long as the overfeeding is kept up. He compared the outcome in five rachitic infants, fed on milk known to be very rich in vitamins, and seven nonrachitic infants given milk supposedly lacking in vitamins, the cows under constant control. No benefit from the high vitamin content and no injury from the lacking vitamins were apparent during the tests, kept up for from forty-one to 122 days. These experiences fail to sustain the theory of rachitis as a vitamin deficiency disease. In treatment of rachitis by relative inanition he varies the food as much as the age of the infant will permit, one-sided food being more likely to overstrain the nutritive apparatus than a variety, other things equal. He reports a number of cases to show the details of his treatment and the complete cure in a month or two under it in every case. The total intake of calories was reduced to 65 or 70 per day, per kilogram of weight, instead of the normal 100 calories. Not more than 60 to 75 c.c. of milk was allowed per day and kilogram. He estimates 70 calories to 100 c.c. of milk, and adds sugar and flour to bring the calories to the proper amount as needed, or potatoes or porridge for the older infants.

Ugeskrift for Læger, Copenhagen

Jan. 12, 1922, **84**, No. 2

*The Growth of Tuberculous Children. I. C. Rahbek.—p. 33.
*Technic for Calomel Injection. B. Pontoppidan.—p. 51.

Growth of Tuberculous Children.—Rahbek's figures of the growth of 500 children in a sanatorium for the predisposed, show that children abnormally tall for their age seem to be peculiarly predisposed to tuberculosis.

Intramuscular Injections.—Pontoppidan avoids the dangers of uneven distribution of the drug in the suspension by having the proper dose made into a pill with cocoa butter. This pill is then placed in the syringe and the syringe is heated until the cocoa butter is nearly melted. The warmth of the body as it is injected completes the liquefaction, and the exact dose is thus deposited. He devised this method in particular for injection of calomel in hospital services.